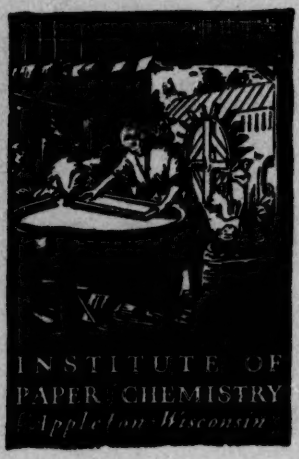
PAGES 1-64

BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

LIBRARY NOTES

SEPTEMBER · 1949

Volume 20 Number 1

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Books and Pamphlets Added to the Library During August

CELLULOSE

HERMANS, P. H. Physics and chemistry of cellulose fibers with particular reference to rayon. New York, Elsevier Publ. Co., 1949. 534 p.

COLLECTIVE BARGAINING

KERR, CLARK, and RANDALL, ROGER. Collective bargaining in the Pacific Coast pulp and paper industry. Philadelphia, published for the Labor Relations Council of the Wharton School of Finance and Commerce by the University of Pennsylvania Press, 1948. 32 p.

CONSERVATION OF RESOURCES

CORNELL UNIVERSITY. Conservation in the United States, by A. F. Gustafson, C. H. Guise, W. J. Hamilton, Jr., and H. Ries. 3d ed. Ithaca, N.Y., Comstock Publ. Co., Inc., 1949.

CORN-STALKS

SWEENEY, O. R., and ARNOLD, L. K. Moisture relations in the manufacture and use of cornstalk insulating board. Iowa Engineering Experiment Station. Bulletin 163. Ames, Iowa, Iowa State College of Agriculture and Mechanic Arts, 1948. 35 p.

ELECTRIC INSULATORS AND INSULATION

NATIONAL RESEARCH COUNCIL. *Division of Engineering and Industrial Research. Conference on Electrical Insulation.* Digest of literature on dielectrics, formerly called Contributions of the chemist to insulation research. Volume I to volume X, 1936-1946 (single volume edition). Washington, National Research Council, 1949. Various paging.

FISH PONDS

EDMINSTER, FRANK C. Fish ponds for the farms. New York, Scribner's, 1947. 114 p.

ISOMERISM

BERGMANN, ERNST DAVID. Isomerism and isomerization of organic compounds. New York, Interscience Publishers, 1948. 138 p.

JAPANESE LANGUAGE

ISHIHARA, JUN, INOUE, TOSHI, and TAMAMUSHI, BUNICHI, comp. Japanese dictionary of physics and chemistry. Rev. and enl. ed. American ed. Ann Arbor, Mich., George Wahr [1939] [The original publisher is Iwanami Shoten of Tokyo] 1666 + 84 + 190 p.

LIGNIN

ARIES, ROBERT S., and POLLAK, ARTHUR. Commercial lignins. Northeastern Wood Utilization Council. Bulletin no. 29. New Haven, The Council, 1949. 23 p.

PAPER MAKING AND TRADE

The PULP & paper manual of Canada; a publication that keeps pace with current developments in equipment, describes ideas for maintaining of plant machinery and provides a catalogue of the equipment and supplies available to the pulp and paper industry with an extensive classified index of equipment and supplies. 17th ed. Gardenvale, Que., National Business Publications Ltd., 1949. 435 p.

PAPER MAKING AND TRADE—HISTORY

HOWARD PUBLISHING COMPANY, comp. 1848-1948, a history of the Wisconsin paper industry. Chicago, Howard Publ. Co., c1948. 76 p.

PAPER MAKING AND TRADE—YEARBOOKS

BARRELL'S Paper annual 1949-1950. Lawrence, Mass., William L. Barrell Co. [1949] v. 8. 55 p.

PRINTING

PRINTING INDUSTRY OF AMERICA. Research and operations manual [Washington, The Association, 1948-] Loose-leaf.

RUBBER—BIBLIOGRAPHY

AMERICAN CHEMICAL SOCIETY. *Division of Rubber Chemistry.* 1940-41 bibliography of rubber literature (including patents). Akron, The Division [1945] 296 p.

TERPENES

SIMONSEN, JOHN L., and OWEN, L. N. The terpenes. 2d ed., rev. Cambridge, University Press, 1949. v. 2. The dicyclic terpenes and their derivatives. 619 p.

TRACE ELEMENTS

MONIER-WILLIAMS, G. W. Trace elements in food. New York, Wiley, 1949. 511 p.

TRADE DIRECTORIES

GREEN BOOK buyers directory, 1949-1950. 37th year. New York, Schnell Publ. Co., c1949. 1440 p.

TREES

U. S. DEPARTMENT OF AGRICULTURE. Trees, the yearbook of agriculture, 1949. Washington, U. S. Govt. Print. Off., 1949. 944 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ADHESIVES

ANON. Adhesives—chiefly for paper. Consumers' Research Bull. 24, no. 2: 21-4 (August, 1949).

Library paste, mucilage, rubber cement, synthetic resin adhesives, and general-purpose adhesives are considered. The constituents, principal uses, and the trade name, price, size of container, and adhesive base of typical products of each type are given. Dry mounting tissue, Scotch tape, and a cellophane-like material coated on one side with a colorless, transparent, pressure-sealing adhesive are described. R.R.

ADVERTISING

ANON. Enlarged, illuminated packages . . . that's showmanship. Packaging Parade 17, no. 199: 38 (August, 1949).

A large replica of a standard package is made of clear plastic sheet with the design etched and painted thereon. A translucent over-all coating protects the design. The display replica is lighted from within to attract buyers. When shown where the product is sold, the new "light-house" display has been very successful. R.R.

AERONAUTICS IN FORESTRY

HARRINGTON, LYN. Tree tally from the air. Western Pulp and Paper 2, no. 8: 10-11, 29 (August, 1949).

The Ontario Department of Lands and Forests is making a forest inventory of the province by aerial photography. The possibilities and limitations of this method are outlined, as well as the use which pulp and paper companies can make of this survey covering their timber limits. Aerial photography does not eliminate timber cruising on foot, but vastly simplifies this tedious and expensive method. Most of the aerial photography is done in summer; however, the tri-camera approach (one set vertically and two obliquely in the airplane floor) has helped to overcome some of the difficulties of winter aerial photography. E.S.

ALKALINE PROCESSES—FURNACES

DENISOV, Y. A. Sulfate reduction in a furnace for caustic regeneration. Bumazh. Prom. 24, no. 1: 16-21 (January-February, 1949). [In Russian]

Initial attempts to explain the influence of individual factors on the sulfate reduction process lead to several conclusions which are useful for the operational improvement of the regenerative stages of a sulfate pulp plant. (1) The degree of sulfate reduction is determined by the active equilibrium concentration of reducing agent (carbon and carbon monoxide); since there is a definite quantitative relationship between carbon and sodium sulfate in

black ash, the degree of sulfate reduction must be predetermined by the relationship between the consumed sulfate and the total alkali which is generated in the furnace (expressed as sodium oxide). (2) Wagner attained optimum reduction (74-77%) in the furnace when the ratio of carbon to sodium sulfate in the black ash was 3.5-4. The ratio, $\frac{Na_2SO_4 \text{ (calc. as } Na_2O) \cdot 100}{Na_2O \text{ (total alkali)}}$, for optimum reduction should be approximately 20% of fresh entering sulfate and approximately 26% of total sodium sulfate (fresh sulfate plus that in black ash). (3) The degree of sulfate reduction varies inversely with the excess air coefficient, since the ratio of carbon to carbon monoxide decreases with an increase in excess air. Optimum reduction is attained in production when the vacuum on the vapor inlet of the first effect does not exceed 1-3 mm. of water, the excess air coefficient in the furnace exhaust does not exceed 1.05, and the carbon content in the ash is not less than 32%. (4) With the same charge and rate of sulfate consumption, sulfate reduction takes place at a lower level in the Wagner furnace than in the furnace at the Novo-Lyalinski mill; this is explained by the introduction of caustic in the high-temperature zone with removal of volatile matter and reduction of carbon content in the ash. (5) The degree of sulfate reduction depends very little on caustic composition and moisture content of the sulfate. (6) The absence of sulfur regeneration in the Wagner furnace is linked with the introduction of caustic in the high-temperature zone. It is recommended that the following steps be taken to increase the percentage of sulfate reduction: (*a*) Increase caustic regeneration and reduce sulfate consumption; (*b*) increase black ash density and maintain close control of carbon content of the ash and of volatile matter; (*c*) reduce suction and air input so that the excess air coefficient in the furnace is 1.05; and (d) increase the input of supplementary fuel in the form of coal dust which is suitable for dehydration of sulfate. E.G.S.

ALKALINE PROCESSES—RECOVERY

PATTERSON, MORLEY E., and LOYD, DON B. Operational difficulties encountered with Pacific Mills Limited kraft recovery unit. Southern Pulp Paper Manuf. 12, no. 8: 32, 34, 48, 50 (August, 1949); Pulp Paper Mag. Can. 50, no. 8: 95-7 (July, 1949).

A brief description of the kraft recovery unit, a Tomlinson-Cottrell precipitator layout, at the Ocean Falls, B.C., mill is given. The problems encountered resulted from increased pulp production; the unit was designed for a liquor-feed capacity of approximately 27,000 lb./hr., whereas the present average feed amounts to 35,000-36,000 lb./hr. This causes a decrease in steam/ton produced with an increase in carry-over and smelting conditions on the super-heater, increased maintenance on brick and lance doors, and deterioration of working conditions on the lancing decks. In addition, severe corrosion of the precipitator is taking place, which can be directly attributed to the high moisture content of the gases, the presence of sodium chloride and sulfur dioxide, and an air leak in the unit. Considerable experimental work has been directed at these difficulties and some improvements can already be observed. The presence of sodium chloride (I) is a handicap to the entire recovery system. It is initially introduced by the salt water-borne pulpwood, especially hemlock logs, which sink lower into the water and pick up (I) by osmosis. A closing up of the recovery system has caused (I) to build up to considerable proportions; it circulates as a dead load through the recovery unit and is even a problem in burning hog fuel. A satisfactory solution has not yet been found. E.S.

BAGASSE

WIGGINS, L. F. The sugar cane as a source of raw materials for chemical industry. Chemistry & Industry [68] no. 32: 555-60 (Aug. 6, 1949).

The importance of research on the utilization of products of the sugar industry is pointed out; the possibilities of cane wax, bagasse, molasses, and sucrose as chemical raw materials are reviewed. E.S.

BARK

GREAVES, C. Canadian wood bark as source of tannin. Canada Lumberman 69, no. 5: 81, 84 (May, 1949).

The author considers the possibilities of procuring Canada's supply of tannins, now virtually all imported, from the bark of eastern and western hemlock, spruce, and Douglas fir, sumac leaves, and sulfite waste liquor. Investigations are planned to determine the value of spruce, Douglas fir, and western hemlock bark for this purpose. R.R.

BARKERS AND BARKING

MCINTOSH, D. C. Some further information on the chemical experiments conducted at Stevens, Ont., during 1947 and 1948. Pulp Paper Mag. Can. 50, no. 8: 128, 130 (July, 1949); *cf.* B.I.P.C. 18: 817-18.

This is a continuation of the previous report, giving a short summary of the results obtained to date on the ease of peeling and reduction in weight and quality of wood, based on observations made during the summer of 1948. The data show that the sap-peeling season can be extended by chemical treatment and that peeling easier than sap peeling can be brought about in the coniferous and broad-leaved species under investigation. The soluble arsenic compound proved to be the most effective chemical tested, and the soluble arsenic-ammonium sulfamate mixture somewhat less effective. Ammonium sulfamate and the sodium salt of 2,4-dichlorophenoxyacetic acid, in general, were not effective in rendering the bark in a condition for hand-peeling methods. Material reduction in weight can be effected in coniferous trees, but not in broad-leaved species. Insect infestation became noticeable when the trees were left standing for longer periods; not all insects affected the different species to the same extent. The sapwood of some trees of all species showed signs of decay when the trees were left standing over a year after treatment. E.S.

BEATING

IMSET, OTTO. Introduction to a discussion of the technical beating problems in the paper industry. Norsk Skogind. 3, no. 6: 145-51 (June, 1949). [In Norwegian; English summary]

The author divides the beating effect produced by the tackle of a beater into two separate effects, that of the edges and of the working surfaces of the flybars. Supplemented by diagrams, the difference in treatment which the fiber receives from the bar edges and surfaces is illustrated. The beating requirements of drawing (I) and greaseproof (II) papers are used as examples of the two extremes in treatment; (I) requires sharp edges with polished surfaces and (II), somewhat rounded edges and rough surfaces. Reference is made to Stephansen's new PFI mill (*cf.* B.I.P.C. 19: 107-8), and to a commercial model of this laboratory beater installed at A/S Follum

Fabrikker, called the "Differential" mill. Beating results obtained with this mill at varying relative speeds of bedplate and roll illustrate the variation in treatment which can be obtained in this manner. The selection of the correct beater tackle for individual requirements and different treatments will be greatly facilitated, if the beating effect of edges and surfaces is taken into account. 11 figures and 3 tables. E.S.

BOARD

MORY, HEINRICH. Contribution to the problems of handmade board production, especially high-quality boards. Das Papier 3, no. 13/14: 274-9 (July, 1949). [In German]

The author discusses general means for controlling machine operation and factors influencing production of so-called handmade boards (made on a one-vat machine and taken off by hand; as many as 20 plies can be couched together in this manner); composition, type, and hydration of stock, thickness of individual plies and their number, thickness of the couched board, pressure at the forming roll, temperature and consistency of the stock suspension, and machine operating data (size of screen slots, diameter of forming roll, type of felt, etc.) are considered. The author also emphasizes the influence of dimensional changes occurring during manufacture on the size of the final sheet. Mathematical expressions are given for the relationship between the wet weight of the ply after being taken off the forming roll, the area of the wet board, the percentage of dimensional change, the thickness and density of the air-dried board, the dry content of the air-dried board and that being taken off the forming roll, and the basis weight of the finished air-dry board. The author also deals with the factors required for determining the output for this type of machine, which are markedly different and more complicated than those involving cylinder- or Fourdrinier-machine operation. The economic feasibility of handmade boards under present conditions is considered. 5 diagrams. L.E.W.

SHAPIRO, A. D. Production of casing and thermo-insulating board. Bumazh. Prom. 24, no. 1: 26-30 (January-February, 1949). [In Russian]

Two types of wood fiberboard are used extensively in automobile construction: (1) rigid casing board for inner panel linings and ceilings of buses, and (2) porous board for thermal insulation of automobile tonneaus. Thermal insulating board is now being manufactured by the Russian Novobelitsk plant and is marketed as "Izoplit." Paper mills at Gorki and Leningrad have facilities for manufacturing casing board. E.G.S.

BONDED FIBER WEBS

NATIONAL COTTON COUNCIL. Survey of cotton in the nonwoven fabrics industry. Am. Dyestuff Reptr. 38, no. 16: 582-3 (Aug. 8, 1949).

Either cards or garnetts are used for processing fibers into web structures. In card webs, the fibers lie parallel and a cloth-like fabric with strength in only one direction is produced; this is most desirable for draperies, napkins, towels, etc. In garnett webs, the more randomly distributed fibers form a web with balanced strength in all directions, which serves best where strength is important, as in fabrics for coating and plastic laminating. The most widely used methods for bonding fibers together include impregnating the web with a resin or other adhesive, blending the thermoplastic fibers

with cellulosic fibers and subjecting the web to pressure with a heated roll to soften the thermoplastic fibers and cause them to act as an adhesive binder, and striping the web with an adhesive which bonds the fibers together at regular intervals. The resin or adhesive content is from 5 to 25%; when thermoplastic fibers are used, the content varies from 5 to 70%. Among the research problems which should be studied are strength, luster, specks, mildew resistance, and harshness. Cotton is better for nonwoven fabrics than other materials with respect to softness, adhesion, absorbency, durability, minimum amount of fuzz or lint, whiteness, and prestige. It is urged that fabrics be developed to compete with paper. Coated fabrics and plastic laminates are briefly considered and potential uses of nonwoven cotton fabrics are listed. R.R.

BROKE

AGRONIN, TANY. Dry broke handling in paper mills. Southern Pulp Paper Manuf. 12, no. 8: 26, 28, 30 (Aug. 15, 1949).

The development of broke beating is described, discussing, in turn, breaker beaters, Hydrapulpers, horizontal pulpers for shallow basements, and Drubbers. Special applications are outlined; illustrations and diagrams of various installations are included. E.S.

CAUSTICIZING AND RE-CAUSTICIZING

NEPENIN, Y. N. Modern continuous recausticizing systems. Bumazh. Prom. 24, no. 2: 15-21 (March-April, 1949). [In Russian]

A comparison is made of various continuous causticizing plants; operational data are included for the Russian Segezhskiĭ, Enso, and Kekhra plants, as well as for installations at Savannah, Georgia, and Kaukopää, Finland. Flow sheets are furnished. E.G.S.

CELLOPHANE

ANON. Trends in textile wraps. Modern Packaging 22, no. 12: 75-80, 164, 166 (August, 1949).

Increasing consumer acceptance of sealed prepacks and a growing awareness of brands are providing impetus for textile packaging, especially flexible transparent unit packs. The initial considerations to be made regarding the packaging of such products are discussed. Heat-sealed cellophane bags are efficient packages for many small textile items; others may require automatic wrapping, perhaps with paperboard stiffness or trays. Among the suggestions made are re-usable plastic bags for sheets and blankets and colorful insert stiffeners printed for identification. Efficient mechanical methods will probably be established within a year for handling many operations now done by hand. R.R.

WEINGAND, RICHARD. Cellophane as packaging material in the food industry. Chem.-Ztg. 66, no. 17/18: 178-80 (April 29, 1942). [In German]

The history, manufacture, and properties of cellophane are briefly reviewed. Special reference is made to water- and water-vapor-resistant types obtained by lacquering with nitrocellulose and additions of wax or paraffin and certain natural or synthetic resins, heat sealing, and applications in the food industry. E.S.

CELLULOSE—HEMICELLULOSE

RATLIFF, FRANCIS T. The possible correlation between hemicelluloses and the physical properties of bleached kraft pulps. Tappi 32, no. 8: 357-67 (August, 1949).

Five graded pine kraft pulps (ranging in yield from 43 to 66.4%) were bleached with acidified sodium chlorite, giving yields ranging from 41.9 to 50.5% (all yields were determined on the unscreened basis). Physical evaluation and chemical analysis of the bleached pulps showed that, in general, strength properties increased continuously with yield and also with the hemicellulose content. Handsheets made from the bleached pulps indicated that the area in optical contact was closely related to other pulp properties. Thus, the area of optical contact appears to be a reasonably direct function of the actual bonded area, and the latter (particularly in the early stages of beating) is correlated with the bursting and tensile strengths of the sheet. Apparently the hemicelluloses manifest their effects upon pulp properties by enabling a high specific surface and bonded area to be developed during beating without much decrease in fiber strength. There appears to be some correlation between the hemicellulose content and the physical properties of the bleached pulps, but these relationships are not as regular as those between pulp yield and physical properties. Analyses show that, even in a very raw cook, an appreciable amount of the α-cellulose originally present in the wood is destroyed or degraded, and that potentially important carbohydrate material is lost even under very mild kraft cooking conditions. 8 tables, 7 diagrams, and 33 references. E.S.

CELLULOSE—HOLOCELLULOSE

LARINKARI, J. Holocellulose. Finnish Paper Timber J. 28, no. 7 A: 55-60 (April, 1946). [In Finnish; English summary]

Holocellulose was prepared from birch- and pinewood by chlorination, followed by extraction of the chlorolignin with a hot aqueous solution of ammonia in alcohol. When wood from deciduous trees is treated with this solvent, it takes on a reddish color; in the case of conifers, it turns brown. Each chlorination and extraction was followed by a half-hour treatment with calcium hypochlorite. The best holocellulose samples were those which still contained 5% lignin. A more severe treatment dissolved further lignin quantities; however, in addition, hexosans and pentosans were removed. This fact is explained by the chemical linkage of lignin with the polyuronic hemicellulose. The characteristic difference between lignin and deciduous trees and conifers is probably based on the difference in the type of lignin and its bond to the hemicellulose. 9 tables and 27 references. E.S.

CELLULOSE FILMS, TRANSPARENT

HINZ, GERHARD. The technology of cellulose triacetate. Angew. Chem. 61, no. 5: 223-7 (May, 1949). [In German]

The manufacture of triacetate films, their properties, and their application for electrical insulating and photographic purposes are described. Threads spun from triacetate rayon are replacing natural silk for cable insulation. 22 footnotes. E.S.

CHEMICAL TESTING—BLACK LIQUOR

COLLINS, T. T., JR. Comparison of methods for determination of sulphide in oxidized sulphate black liquor. Paper Trade J. 129, no. 8: 29-33 (Aug. 25, 1949).

In connection with work on the oxidation of sulfate black liquor, the various methods at present in general use for determining sodium sulfide in black liquor samples were evaluated. The Bergström-Trobeck method and its modification (*cf.* B.I.P.C. 10: 185), a modified TAPPI procedure (*cf.* B.I.P.C. 13: 49-50), the Moltzau method (*cf.* B.I.P.C. 13: 9), and the Borlew and Pascoe method (*cf.* B.I.P.C. 16: 326-7) are briefly described, and their advantages and shortcomings are compared. For the present purpose, the Borlew and Pascoe method was selected, because it presented the simplest and most rapid way for carrying out the analyses. The sulfite in the black liquor does not interfere and, if the analysis is carried out rapidly, no very great error is caused by oxidation of the sample during the titration. Although the endpoint is arbitrarily chosen, it is very closely reproducible. The method also appears to be more accurate than the others on liquor samples in which the sulfide sulfur is almost or completely oxidized. 8 references. E.S.

CHEMICAL TESTING—CARBOHYDRATES

VILES, FREDERICK J., JR., and SILVERMAN, LESLIE. Determination of starch and cellulose with anthrone. Anal. Chem. 21, no. 8: 950-3 (August, 1949).

A procedure is presented for colorimetric analysis of starch and cellulose at a wave length of 625 mμ using a 0.1% solution of anthrone in concentrated sulfuric acid. The method is accurate for ranges of 10 to 200 micrograms and sensitive to 2 micrograms of these substances. Because of the instability of the reagent, a known standard must be used with each set of analyses to determine the correct Beer's law constant. Color intensity studies of the effect of heat upon the reaction between anthrone reagent and starch and cellulose are presented. Spectral transmittance curves of carbohydrate-anthrone colors prepared under different conditions are also included. E.S.

CHEMICAL TESTING—CELLULOSE—ACCESSIBILITY

TIMELL, TORE. Cellulose reactions. X. Two methods for estimating the amount of accessible material in cellulose (preliminary report). Svensk Kem. Tid. 61, no. 6: 125-7 (June, 1949). [In English] *cf.* B.I.P.C. 19: 762.

The reaction of cellulose with metallic sodium in liquid ammonia to form an alcoholate, which was known to involve an initial rapid change followed by a much slower one, has been used to distinguish between the disordered, or accessible, and the ordered portions of cellulose structures. Three samples, cotton linters, sulfite wood pulp, and viscose rayon, previously used in this series were investigated. The reaction was carried out in absolutely dry liquid ammonia at −33° C. The hydrogen formed was removed with a current of nitrogen, washed free of ammonia, then dried and burned with oxygen to water, which was absorbed and weighed. The amount of reaction plotted against time shows an initial rapid change followed by a slow, almost constant one. Extrapolation of the linear part of the slow rate back to zero time has given values for the accessible portion of 39, 43, and 58% for cotton linters, sulfite pulp, and viscose rayon, respectively. These values are considered to be in reasonable agreement with those obtained by such methods as the exchange of cellulosic hydrogens with heavy water. A second method is directed at measuring the amount of accessible material in dry, unswollen cellulose, and could be expected to give results similar to etherification with thallous ethylate or diazomethane. It involved the methylation of trisodium cellulose after the complete removal of ammonia. The reaction was carried

out at 20° C. in benzene, with an excess of methyl iodide. In all the samples, 1.5 to 2.5% of the material seemed to be accessible for methylation, i.e., the same as found by alkylating alkali cellulose with isopropyl bromide (*cf.* B.I.P.C. 19: 762). M.A.H.

CHEMICAL TESTING—CELLULOSE—FRACTIONATION

SCHERER, PHILIP C., and MCNEER, REMBERT D., JR. Mechanical properties of high polymers as functions of the shape of the distribution curve. II. Controlled fractionation of ethyl cellulose. Rayon and Synthetic Textiles 30, no. 8: 56-9 (August, 1949); *cf.* B.I.P.C. 19: 152-3.

As in previous experiments, ethylcellulose was fractionated into eight fractions, the D.P.'s of which decreased progressively. The solvent used consisted of 20% ethyl acetate and 80% acetone by weight; the precipitating agent was a mixture of 25% acetone and 75% water by weight for the first five fractions, and pure water for the succeeding ones. After removing seven fractions, it was no longer possible to precipitate ethylcellulose from solution, even with a large amount of pure water, and an eighth fraction was obtained by boiling off the ethyl acetate and acetone under reduced pressure. The details of the procedures are described. The D.P. of the fractions was determined from viscosity measurements of a 1% solution of the material in butyl acetate by the use of the Staudinger viscosity law. The ethoxy content of the fractions showed no significant variation, which indicated that there probably was little degradation during the procedure. To determine the effect of storage on the samples, their viscosities were checked after 47 days' storage at room temperature in brown bottles; the resulting data showed no tendency for degradation. The method is at present used in the fractionation of relatively large amounts of the material with apparently considerably enhanced accuracy of control. The fractions thus obtained are being blended into arbitrary mixtures, having distinctly different distribution curves, whose physical properties are examined. A report of the results will be published later. 4 tables, 3 diagrams, and 7 references. E.S.

CHEMICAL TESTING—PAPER—ACIDITY

LITHOGRAPHIC TECHNICAL FOUNDATION. Ways to determine the pH value of paper. Am. Printer 128, no. 7: 43-4, 46 (July, 1949); *cf.* B.I.P.C. 19: 617.

The first part of the article is identical with the earlier reference. In addition, a discussion is given of measuring pH with colored indicators and with electrometric equipment. There are 13 different indicators in general use; each changes color over a different range of about two pH units. Some of the more common color indicators with their useful ranges are tabulated and a typical determination is described. The advantages and disadvantages of the method are given. Indicator dyes are also available as test papers, which are strips of paper dyed with the indicator. The strip is dipped into the solution to be tested and the resulting color compared with printed color standards. Test papers do not measure pH as accurately as indicator solutions. The electrometric method is based on a simple electrolytic cell or special electric battery. The cell is formed by a "reference electrode" and a "glass electrode" in contact with the solution in question. The voltage produced is compared with the voltage of a solution of known pH. A voltmeter dial on a modern pH meter is usually calibrated to read directly in pH units. The use of the meter, care of buffer solutions, and precautions to be observed with glass electrodes are discussed. R.R.

VAN DER WYK, A. J. A., and STUDER, M. The acidity of cellulose. Helv. Chim. Acta 32, no. 5: 1698-1712 (Aug. 1, 1949). [In French]

Methods which have been used to determine the acidic character of cotton cellulose are reviewed and compared, showing a wide variation in results. To develop a more accurate and reproducible method, the authors have applied the Donnan theory as a theoretical foundation, and have developed equations to support their conclusion that, if the material is suspended in 0.6 *N* sodium chloride solution, the "cellulose acid" can be titrated as a soluble acid, a determination of which is impossible in pure water. Experimentally, the cellulose suspension in a measured quantity of 0.6 *N* sodium chloride solution is titrated with 0.01 *N* alkali until a permanent color of the internal indicator is obtained. Different indicators are used for different pH conditions. It is necessary to carry out the titration in a platinum container rather than glass, to protect the reaction mixture against carbon dioxide, oxygen, and dust, to provide a slow, horizontal shaking of the container, and to allow sufficient time after each addition for the Donnan equilibrium to be reached. Measurements were made on cotton and on high α-cellulose (98%) wood pulp, in their original state and after regeneration from cuprammonium solution. The titration curves obtained with cellulose are analogous to that of a monobasic acid. A method for calculating the dissociation constant from two or more experimental values at different pH conditions, without knowing the molecular weight, is developed mathematically. The following dissociation constants are reported: native cotton, 8×10^{-8}; regenerated cotton, 5×10^{-8}; and high α-pulp, 4×10^{-7}. The dissociation constants of carboxylic acids are 1000 to 10,000 times greater than these values, and it is concluded that pure cellulose does not contain carboxyl groups, but that the acidic character of the material is caused by its accumulation of hydroxyl groups. 25 references. M.A.H.

CHEMICAL TESTING—TALL OIL

LINDER, ÅKE, and PERSSON, VIKTOR. A new analytical method for fatty and resin acids. Svensk Papperstidn. 52, no. 13: 331-7 (July 15, 1949). [In Swedish; German and English summaries]

Fatty and resin acids have different rates of esterification, and most of the analytical methods presently used for their separation are based on this fact. However, as none of the reaction products formed is removed, a portion of the fatty acids is not esterified and the resulting values are, in general, not sufficiently accurate. By esterification with a mixture of *n*-butanol and benzene, the formed water can be separated and removed in a simple manner, so that complete esterification of the fatty acids results. Simultaneously, however, a partial esterification of the resin acids takes place. To reduce this reaction to a minimum, low concentrations of the catalyst and esterification temperatures not in excess of 125° C. must be used. Benzene sulfonic acid (I) was found to be a more suitable catalyst than sulfuric acid (II). (I) is not affected by the reaction; since the concentration of the catalyst is constant, a definite amount of resin acids is esterified per unit time and an exact correction can be made for this fraction which is converted simultaneously with the fatty acids. (II), on the other hand, reacts with the rest of the reaction compounds, so that its concentration gradually decreases. For uniform results, the esterification should be carried out on a constant temperature (125° C.) oil bath. The method was checked with mixtures of known compositions and found to give reproducible values. Most determinations on tall oil in Sweden are now carried out according to the Swedish Standard CCA15 (*cf.* B.I.P.C. 16: 541-2); the results give excessive resin

percentages and larger differences between parallel tests. The determination of unesterified resin acids in the reaction mixture were made titrimetrically in the present study; in case of resin acids with different molecular weights, gravimetric methods should be applied. 7 tables, 4 figures, and 6 references. E.S.

CHROMIUM PLATING

BELVIN, CHARLES H. Electroplating for paper machinery. Paper Mill News 72, no. 34: 60, 62, 64, 90 (Aug. 20, 1949); Paper Ind. 31, no. 5: 616-18 (August, 1949).

The chemical and physical characteristics of chromium as a plating agent, pretreatment of the articles to be plated, and possible and actual applications in the pulp and paper industry are discussed. Chromium resists corrosion, wears exceedingly long, and enhances quality production; it may be used for tubing, pipes and fixtures, chipper disks, beater bars, flat and curved screen plates, and a great variety of rolls, including those used in coating and converting operations. The plating of rolls is the most outstanding and extensively followed application in the industry. E.S.

COLORIMETRY

TAYLOR, G. G. The measurement of colour. Paper-Maker (London) 118, no. 2: 99-105 (August, 1949).

Following a discussion of the significance of the term "color" and the three factors upon which the sensation of color depends (illuminant, object, and observer), several instruments for the measurement of color, their principles, and their mode of operation are described, including the Ogal colorimeter, the Spekker photoelectric absorptiometer, the Hardy spectrophotometer, and the Lovibond Tintometer. The application of these instruments to practical papermaking problems is discussed, with emphasis on the fact that most of them are less suitable for a paper mill than for a research laboratory. For many purposes, notably the rapid matching of closely similar shades, the unaided eye is quite satisfactory to supply this immediate, although approximate information, provided its limitations are appreciated and allowances made for it. 10 diagrams. E.S.

CORROSION

BALDWIN, A. T. The use of Lithcote in the pulp and paper industry. Paper Mill News 72, no. 32: 18, 24 (Aug. 6, 1949); *cf.* B.I.P.C. 18: 587.

The applications of Lithcote, a baked-on phenolic thermosetting resinous coating, and its limitations in the pulp and paper industry are described, with special reference to its use as a corrosion and slime inhibitor. E.S.

DISINFECTION AND DISINFECTANTS

FISCHER, HENRY D. Preservation of groundwood pulp. Tappi 32, no. 8: 67-8A (August, 1949).

With reference to Shema's data (*cf.* B.I.P.C. 19: 696-7), the author gives the results of experiments obtained in the storage of groundwood pulp during 1937-38. The bales were treated with Dowicide, Permatox, or Lignasan and examined at intervals for storage periods up to 10 months. The Dowicide-treated pulp was free of mildew and had a comparatively good color. It could be run satisfactorily on the paper machine; however, the evolution of

phenol was so great that more suitable preservatives had to be sought. Permatox-treated pulp, after a number of months, began to show considerable mildew and a few fungus spots; the color deteriorated somewhat, so that the pulp could no longer be used for the better grades of board. The Lignasan-treated pulp preserved in general an excellent color, but showed some mildew and fungus spots near the edges, possibly from reinfection. E.S.

FEED WATER

CHANEY, LEE F. Treating boiler feedwater. Pulp & Paper 23, no. 9: 88 (August, 1949).

In high-pressure steam plants, proper water conditioning is essential and more care must be given to the proper selection of pretreating equipment and the supervision and control of the entire water-treating program than is normally given with lower-pressure systems. The feedwater must be essentially free of scale- and sludge-forming materials; the boiler water must contain very little suspended matter, sludge, silica, and dissolved solids and have a reasonably low alkalinity; and oxygen and carbon dioxide must be eliminated from feed water to protect the entire system from corrosion and prevent any corrosion products from returning to the boiler where they might cause iron oxide scale, a possible source of serious trouble. Types of pretreating equipment are listed and suggestions are given for helping to determine the right equipment for a given situation. Factors which must be considered for after-treatment are deposits in the feed line, high-pressure heater, and economizer; feed-line and economizer corrosion; sludge conditioning; condensate and drier corrosion; and caustic embrittlement. Any improvement in water treatment and control will usually result in lower steam and maintenance costs and less down-time. R.R.

FOAM

SERGEANT, S. V. The problem of foam in the paper mill. Frothing of wood pulp suspensions. Paper-Maker (London) 117, no. 6: 411-14, 416-17; 118, no. 1: 32-4, 36-7 (June, July, 1949).

The first part of the article is a literature survey, confined mainly to the past two decades; it deals with the structure and properties of foam and gives examples of its occurrence in nature and its importance to industry (flotation of minerals, fire-extinguishing agent, in laundry work, etc.). The general aspects of the froth in the paper mill are considered, followed by a review of the mechanical and chemical means which have been proposed for its prevention and eradication. The mechanical methods are based on the application of reduced pressure, the use of an air curtain, water sprays, etc., whereas the chemical agents proposed are chiefly of an oily nature and include such liquids as paraffin oil, pine oil, and octyl alcohol. 50 references. In the second part, a detailed account is given of an unsuccessful attempt to isolate the agent responsible for the frothing of wood-pulp suspensions. Experiments are also described for establishing the efficacy of various proprietary preparations and other antifroth chemicals. The results of this work show that froth trouble may arise from one or more of a variety of causes and that, as conditions vary from time to time and from mill to mill, the problem of overcoming foaming will have to be studied from different angles. There is no universal cure-all for foam troubles; what is needed in any given mill which experiences frothing is a systematic and thorough investigation of existing conditions to detect the responsible sources. Only then can the correct preventative or remedial measures be prescribed and the trouble minimized or, possibly, eliminated. E.S.

FOLDING BOXES

ANON. Glamour cartons. Modern Packaging 22, no. 12: 102-3, 158, 160 (August, 1949).

Illustrated descriptions are given of folding boxes with novel flaps and unusual shapes, some of them made of newly developed laminates. An attractive candy carton has an inside construction such that a complete inner tray is formed to hold the contents. The front flaps of another container can be opened to reveal a complete double-walled shadow box for the display of the contents. A "carry-all" package is made in one piece and has a handle. These and the other packages described cost about half as much as comparable setup boxes and are easily made up. R.R.

ANON. Open-end cereals. Modern Packaging 22, no. 12: 82-5 (August, 1949).

The Quaker Oats Co. has introduced a new type of single-service package consisting of a paperboard sleeve with a cellophane overwrap forming the top and bottom. The principal features of the new package include visibility, economy, and ease of opening. The 30-40% saving on paperboard and the elimination of the previously used wax liner more than offset the cost of the cellophane overwrap. The sleeve cartons are printed bleached manila board; the overwrap is 300 MST-54 cellophane. Package-making machines form flat scored carton blanks into sleeves with a glued seam and overwrap them, leaving the top open; the side seams of the overwrap are sealed with a hot-melt adhesive and the bottom is heat sealed. Filling units fill two sleeves at a time and heat seal the top of the wrap. The package lines operate at about 80 units/min. The single-serving packages are assembled in packs of 10, placed on die-cut trays, and the whole is overwrapped. The packages are shipped in corrugated containers. R.R.

FORESTS AND FORESTRY

AVERY, B. F. Silvicultural research in relation to implementation of CPPA statement on forest policy. Pulp Paper Mag. Can. 50, no. 8: 136, 138 (July, 1949); *cf.* B.I.P.C. 18: 592.

"It requires conviction on the part of the membership of the Canadian Pulp and Paper Association that research is so fundamental to implementation of its forest policy, that substantial and adequate funds for long-term projects will be voted and will continue to be voted for such work." E.S.

CRAIG, RONALD B. The major forest economic problems in the longleaf—slash pine—cypress region. Southern Pulp Paper Manuf. 12, no. 8: 38, 40, 42, 50 (August, 1949).

In the author's opinion, the paramount forest economic problems in northeastern Florida and the flatwoods portion of southeastern Georgia today are: (1) the integration of timber, naval stores, and cattle production on a profitable basis; (2) the costs and returns of reforesting the denuded areas of northeast Florida; and (3) the economics of adequate fire protection. It is to the solution of these problems that the research in forest economics at the Lake City Branch Station of the Southeastern Forest Experiment Station is now directed. The primary objective of this research is to aid in tripling the financial return from forest use, which even today is the principal source of income in many of the rural counties of this territory. E.S.

HAGENSTEIN, W. D. More wood per acre. Paper Trade J. 129, no. 7: 33-5 (Aug. 18, 1949).

Remarkable progress in forest management has been made on the 3,008,638 acres of tree farms in the Douglas fir region since the initiation of the tree farm program in 1941. By making intensive inventories, developing new markets, and aiding in the planning of operations which may include thinning, prelogging, relogging, and salvage logging, foresters employed by tree farms have contributed greatly toward improved utilization, greater production, and better forest management. Case histories of 12 company operations on tree farms indicate the extent of the improvement in utilization and forest management that has been achieved. 5 references. E.S.

MACDONALD, D. A. Managing the forests. Pulp Paper Mag. Can. 50, no. 8: 140, 142 (July, 1949).

Some of the fundamental aspects are discussed which must be considered when planning for forest management on a sustained-yield basis, such as closer co-operation between government and industry, increased knowledge of the conditions governing forest development, and an adequate forest inventory with regeneration, growth, and yield data. E.S.

SHIRLEY, HARDY L. Employment and unemployment in forestry. Paper Trade J. 129, no. 6: 18-20, 22 (Aug. 11, 1949).

The author discusses forestry conditions in the United States in the past and the effect of unrestricted cutting on forest employment, changes in forestry practices which are taking place, and the stabilizing influence of professional foresters on the employment situation in the forest industries. 17 references. E.S.

TINKER, E. W. Government policies and our forest lands (Quo vadis). Southern Pulp Paper Manuf. 12, no. 8: 43-5, 50 (August, 1949); Paper Trade J. 129, no. 5: 12-14 (Aug. 4, 1949); Paper Mill News 72, no. 32: 16 (Aug. 6, 1949).

The author discusses existing basic differences in political philosophy with regard to public and private ownership of forest lands and upholds the rights for private industry. E.S.

WATTS, LYLE F. Are we depleting United States forests? Paper Mill News 72, no. 32: 11, 14 (Aug. 6, 1949); *cf.* B.I.P.C. 19: 772.

The United States is not "running out of wood" in the sense that the country will be entirely out of wood; however, the trend of sawtimber is downward and the sawtimber "bank account" is heavily overdrawn. For the country as a whole, growing stocks are far short of what will be needed to meet on a sustaining basis the prospective long-term needs of a growing population and a rising standard of living. To stop this downward trend of the forest resources and to build up forest growth, the Forest Service has recommended action along three main lines: increased public aids and services to private forest-land owners; public control of cutting and other forest practices; and expansion and intensified management of public forests. The Forest Service believes that deterioration of forest resources has already gone so far that a period of reduced supply of timber products is inevitable. The longer decisive corrective actions are delayed, the more severe the period of shortage will be and the more drastic the measures which will have to be taken. E.S.

FUEL

DE LORENZI, OTTO. Burning wet wood. Wood 4, no. 8: 20-1, 45 (August, 1949); Mech. Eng. 71, no. 9: 735-8 (September, 1949).

Probably the most widely available refuse fuel is wet wood containing about 30% moisture. Wet wood is a large-quantity by-product of the lumber (I), pulp (II), and naval stores (III) industries. Reference is made to the latest developments in the burning of such wood. In the case of (I), the fuel is made up of sawdust, shavings, bark, and other wood waste. In place of the common three-cell Dutch ovens, a single-stage furnace, 20 feet high, has been developed, in which the wood is burned in a pile, supplied by the underfeed method through a retort, which forces it gradually upward. In (II), the principal problem is one of wet-bark disposal. Two-stage Dutch ovens designed for excessively wet bark and some supplementary fuel are chiefly used; some of these are equipped with sloping grates. Spreader-stoker firing is the most recent development. The refuse from (III) comprises spent-wood chips; for this type of waste, water-cooled, single-stage furnaces with spreader stokers are being developed. E.S.

FUNGI

MARSH, P. B., BOLLENBACHER, K., BUTLER, M. L., and RAPER, K. B. The fungi concerned in fiber deterioration. II. Their ability to decompose cellulose. Textile Research J. 19, no. 8: 462-84 (August, 1949); *cf.* B.I.P.C. 19: 773.

On the basis of a survey of the literature and of test results reported on more than 400 fungus isolates, cellulose-decomposing activity is shown to be very widely distributed but not universal among the fungi. It occurs with a high degree of regularity among isolates of certain genera—e.g., *Alternaria, Chaetomium, Curvularia, Fusarium, Gliomastix, Helminthosporium, Humicola, Memnoniella, Stachybotrys,* and *Trichoderma,* and probably with equal frequency in other genera which have not been so extensively studied. It occurs in a greater or smaller number of species in many of the several groups or subdivisions of the genus *Aspergillus* (but apparently not in all of them), in a much smaller but rather widely diverse group of species in the genus *Penicillium,* apparently not at all in *Mucor, Rhizopus,* and other genera of the Mucoraceae, and probably only rarely among the actinomycetes. Tests on *Cladosporium herbarum* show that the optimum temperatures for growth of isolates of this fungus are in general distinctly below the temperature (approximately 30° C.) used by several other workers in experiments with it; this fact is believed to account, at least in part, for the poor cellulose-decomposing activity shown by it in their tests. Tests on *Pullularia pullulans* have failed to detect cellulolytic activity. 7 tables and 48 references. E.S.

GUMS AND RESINS

WISE, LOUIS E. The polysaccharide from *Iles mannane.* Arch. Biochem. 23, no. 1: 127-30 (August, 1949).

Iles mannane, the powdered root of *Amorphophallus oncophyllus,* was sifted into boiling water, stirred, cooled, and centrifuged. The decanted solution was precipitated with alcohol, washed with alcohol and ether, and dried. The resultant white polysaccharide was shown to contain largely mannose and glucose units, together with subordinate amounts of uronic anhydride and pentosans. Whether the polysaccharide is actually a true mannoglucan or a mixture of mannan and glucan is still indeterminate. The polysaccharide is an excellent beater additive. 7 references. L.E.W.

HEATING (HIGH-FREQUENCY)

DONSKOI, A. V., and SENCHENKO, Y. I. Gluing board in a high-frequency electrical field. Bumazh. Prom. 24, no. 1: 30-2 (January-February, 1949). [In Russian]

In the past, multilayer board has usually been made by simply gluing sheets of single-ply board (1-3 mm. thick) without heating. The glue-hardening process required two to three days, and the resulting laminated board contained 20-25% moisture. The hardening time can be reduced considerably if heat is applied. The moisture in the glue evaporates without penetrating the board; the decreased moisture content of the finished product improves its quality and broadens its application. The high-frequency electrical heating unit consists of a vacuum-tube oscillator and anode circuit; dielectric heating is accomplished by placing the glued board between the plates of a two-plate condenser. A detailed description of the oscillator is included. Experimental drying data are also given. E.G.S.

HISTORY

GAUT, MARCEL. Letter paper. Papetier 3, no. 5: 1057, 1059, 1061 (May, 1949). [In French]

These are historical ramblings on the origin of paper and its spread to France which cover the early methods of conveying written messages, the introduction of a postal service in France in 1466, early letter papers, which were just folded and sealed with wax, and the use of envelopes made by hand since 1668. The construction of railways and the introduction of steamship navigation gave a great impetus to letter writing and the manufacture of envelopes; the first machine for folding the paper and gumming the flaps with gum arabic was constructed around the year 1854. Prior to that date, all envelopes were still sealed with wax. A reproduction of the front and back side of an envelope dating from 1852 is included, which carries the handwriting of Lamartine. E.S.

HUMIDITY

SCHEFFER, THEODORE C., and TORGESON, OSCAR W. Humidifying apparatus for small test rooms. Science 110, no. 2852: 214-15 (Aug. 26, 1949).

A hygrostat and a humidifier are described which were developed at the U. S. Forest Products Laboratory and which have been used to maintain an atmosphere of 70 ± 2% R.H. and 80° F. in 600-cu. ft. rooms; no adjustments in setting were necessary because of changes in the hygrostat. The novel features of the unit consist of a wood element and a microtype switch sensitive to a very slight movement of the element. 2 diagrams. R.R.

INSTRUMENTATION

LAVERY, HUGH H. Instrument application at I. P. mill. Tappi 32, no. 8: 51-4A (August, 1949).

The author describes the instrumentation applied at the Hudson River mill of the International Paper Co., an integrated mill making groundwood papers. The mill existed before instrument control became prominent, so that it is not an instrument-controlled mill in the modern sense. However, instruments are used to solve many problems in fuel and power conservation, process and waste control, evaluation, maintenance, etc. An outline of the more important applications is given. E.S.

MURPHY, E. A. Increasing chemical recovery by efficient multiple effect and disc evaporator operation. Paper Trade J. 129, no. 5: 23-6 (Aug. 4, 1949).

The intelligent application of industrial instruments and controls to multiple-effect and disk evaporators is outlined, with emphasis on close control of variables in a continuous process, where any fluctuation in one stage will upset all preceding and following stages. 5 figures. E.S.

SHOLL, HAROLD A. Instruments and controls; factors in their selection. Tappi 32, no. 8: 378-82 (August, 1949).

Paper-mill instrumentation has progressed from the experimental stage to a condition of certainty for most applications. However, standardized procedures cannot be prescribed for the majority of instrument control uses because few processes are identical. Instrument and control selection can be based on experience gained by mill and instrument engineers from similar installations, but this serves only as a starting point. Factors paramount to one application may be relatively unimportant or completely absent from another so that previous application experience must be supported by a thorough engineering study of the problem at hand. Determination of all variables and required results may indicate the need for elaborate cascade control in one case or, in other cases, a simple inexpensive controller. The complete analysis of each control application makes possible accurate prediction of process results to be expected from the expenditure for instrumentation; thus, such expenditures are more firmly justified to management. 3 diagrams. E.S.

KRAFT PULP AND PAPER

LEHTIMÄKI, LEO. Kraft paper during the war crisis in Finland. Finnish Paper Timber J. 28, no. 7 A:53-5 (April, 1946). [In Finnish; English summary]

In spite of all war-created problems, the Finnish kraft paper industry expanded during the critical years and was able to meet the considerably increased domestic demand, for which kraft paper bags and spinning paper were chiefly responsible. The use of spinning paper was the main factor in overcoming successfully the very serious shortage of all kinds of textiles. E.S.

LIGNIN

ARIES, ROBERT S., and POLLAK, ARTHUR. Commercial lignins. Northeastern Wood Utilization Council, Bull. no. 29: 1-23 (July, 1949).

After brief reference to the significance of the word "lignin" and the abundance of the material in nature, the commercial forms of lignin, their trade names, and their manufacturers are tabulated. The properties of lignins from sulfite waste liquor (including the calcium lignosulfonates), with particular reference to the Marathon Howard process, alkali lignins (Meadol, Tomlinite, Arborite, and Indulin), acid hydrolysis (Scholler and furfural) lignins, steam hydrolysis or Masonite lignins, and Douglas fir bark lignins (Silvacon) and their possibilities, are reviewed. So far, the greatest obstacle to the utilization of lignins has been the lack of data on their properties and the nonexistence of uniform, reproducible grades of the material. Samples of the principal commercial products which are now on the market were found to be fairly uniform when tested in various ways. Systematic researches on the properties of lignins and their derivatives have recently been organized

at the Brooklyn Polytechnic Institute, in co-operation with some of the many industries interested as potential producers and users of the material. 83 references. E.S.

BELL, ALAN, and WRIGHT, GEORGE F. The carbonyl group in birch lignin. Can. J. Research 27 B, no. 6: 565-71 (June, 1949).

When lignin is extracted from birchwood with acetic acid, its behavior differs from that of lignin extracted with acetic acid and then boiled with formic acid. There is less hydroxyl lost per methoxyl gained when the lignin treated with formic acid is methylated with diazomethane. An increase in addition of Grignard reagent also corresponds to this increase in methoxyl. This indicates that a lactone linkage is present in extracted lignin but probably not in lignin in the wood, because the effect is less noticeable in lignin more mildly extracted by acetic acid. In lignins which have been methylated with dimethyl sulfate and alkali, where the lactone would no longer be present, there is evidence of a carboxyl group which can be diazomethane-methylated and the resulting ester saponified at will. E.S.

BELL, ALAN, and WRIGHT, GEORGE F. The isobutyl group in spruce and birch lignins. Can. J. Research 27 B, no. 6: 572-9 (June, 1949).

Acetone has been isolated by permanganate oxidation of birch and spruce lignins extracted from wood by acetic or formic acid. Acetone was obtained also when the formic acid lignins were ozonized but not from the acetic acid-extracted lignins. This difference was confirmed when perbenzoic acid titration indicated unsaturation in the formic acid extract which was not present in the acetic acid extract. It is suggested that an α-hydroxy-β-methoxyisobutyl group is present in lignin; during acetic acid extraction the hydroxyl group is acetylated but during formic acid extraction the formic acid reduces the group to isobutenyl, which will give acetone when it is ozonized. 11 references. E.S.

LOADING AND UNLOADING—CARS

ANON. A new type boxcar for newsprint. Pulp Paper Mag. Can. 50, no. 8: 177 (July, 1949).

Five hundred new Canadian Pacific Railway boxcars are each equipped with 40 strip-lading anchors to facilitate the securing of a partial carload of package freight and newsprint. Known as the "Brigadier Strap Anchor," the anchors holding the straps are moored to metal posts behind the plywood interior of the cars; they are firmer and easier to handle than the old wooden bulkheads. 2 illustrations. E.S.

ANON. Show your customers how to use retaining paper method of unitized loading. Paper Sales 9, no. 8: 15 (August, 1949).

The retaining paper method of unitized loading advocated by the Freight Loading and Container Section, Association of American Railroads, effectively reduces damage to commodities shipped in fiberboard or corrugated containers. As illustrated, the end sections of the load are wrapped with a paper binder to hold the containers in these sections in place and to act as a floating bulkhead to protect the goods. Duplex reinforced paper is usually employed, such as two 40-pound kraft sheets laminated with about 40-pound asphalt in which reinforcing threads are embedded. R.R.

LUBRICATION AND LUBRICANTS

EVANS, KEETH J. Lubrication of phenolic bearings. Paper Mill News 72, no. 34: 40, 80, 88 (Aug. 20, 1949).

Phenolic bearings may be lubricated with water, soluble oil, oil, grease, or a combination of these; in all cases, the cooling of the journal is the most important factor. The lubricant supply must be constant and any sediment or scale washed out carefully. Special operating conditions, bearing design, submerged bearings, and scale guards also receive consideration. E.S.

MACHINERY—BELTING

AMERICAN LEATHER BELTING ASSOCIATION. How to maintain your leather belts. Paper Mill News 72, no. 34: 70 (Aug. 20, 1949).

Directions for the maintenance of leather belting include points on regular inspection, belt tension, alignment of shafting, laps and plies, recrowning of worn pulleys, and treatment of blisters. E.S.

MACHINERY—CHIPPERS

HAYES, JAMES C. Chips from veneer waste. Paper Trade J. 129, no. 5: 26-7 (Aug. 4, 1949).

A veneer chipper is described for converting reject veneer sheets into chips for pulpmaking. It resembles a conventional chipper, although the knives are set differently; the most recent designs have 66-inch disks equipped with six knives. It is primarily adapted to the chipping of lightweight, thin material. Chips produced from veneer rejects are quite satisfactory; they are uniformly thinner than ordinary chips, but show no appreciable difference in cooking requirements. E.S.

MACHINERY—CONSISTENCY REGULATORS

SCHÄDLER, MAX. Automatic consistency regulation of pulp suspensions. Das Papier 3, no. 11/12: 215-23 (June, 1949). [In German]

The physical fundamentals of stock consistency regulation are discussed. The mathematical treatment is correlated with practical experiments with different consistency regulators operating under varying conditions. The construction principles of different systems are compared, including the Trimbey, Säll, Källe, Meyers, Arca, Voith, Poljakow, and Tjagunow regulators. The data are summarized from a doctor's dissertation (Darmstadt, 1948). 21 diagrams and 10 footnotes. L.E.W.

MACHINERY—CONVERTING MACHINERY

ANON. Automatic printing and die-cutting machinery. Allg. Papier-Rundschau no. 6: 265-75 (July 15, 1949). [In German and French]

Several German and American constructions for the manufacture of folding cartons and similar mass packages are described, which combine printing, die-cutting, scoring, and stripping operations. The American machines are special machines, usually designed for a limited number of types produced in huge editions; hence, they operate at very high speeds. The German machines, on the other hand, are multipurpose constructions equipped with speed regulators for different operations; they can never attain the speed of a "unipurpose" machine. Thirteen illustrations are included in the French section of the article. E.S.

BLAKEMORE, FRED T. Swedish bag maker and printer introduced to U. S. Am. Paper Converter 23, no. 8: 10, 21 (August, 1949); Paper Trade J. 120, no. 11: 32 (Sept. 15, 1949).

A description is given of the Nilsa automatic multiwall-bag machine and the Nilsaton, a new type of multicolor printing press, which are now available in the United States. Special attachments may be purchased for making cellophane windows and dustproof bags. The bag machine and printing press operate with two or three colors at the same time; their normal speed on specialty bags is 12,000-15,000/hr. The unique feature of the Nilsaton press is an ink fountain which eliminates rubber rollers on the press; their absence reduces the time for color changes to an average of 5 minutes. R.R.

MACHINERY—DRYERS

SCHMIDT, KARL. The application of the laws of drying and ventilation to the construction and operation of pulp- and paper-drying machines. Das Papier 3, no. 5/6: 73-82; no. 7/8: 118-31; no. 9/10: 159-69 (March-May, 1949). [In German]

The cost of drying represents a considerable portion of the total cost of paper manufacture; the percentage of the construction cost of the drier part of two typical paper machines is 71.5% in the case of a high-speed newsprint Fourdrinier, and 52% in the case of a Yankee machine with a cylinder diameter of 5 m. Continued efforts have been made to improve drying efficiency/drier surface unit, in order to keep the drier-section cost within economically feasible limits. However, the present system of drying by evaporation based on heat convection has its limitations with regard to drier efficiency and heat consumption, beyond which further progress is not possible. Provisions have also been made on paper machines for the efficient removal of the evaporated water, and the drying and ventilating equipment is now generally considered as one unit. The high demands placed on such installations require extreme care and accuracy in planning and operations. In the present study the most important factors are discussed with frequent reference to existing literature, including the physical laws of thermal drying; their application to different pulp and paper driers, with and without hoods and felts; a comparison of results obtained in the operation of three Yankee machines; the essentials of paper-machine ventilation; and brief general directions along which further developments should be directed (improvements in the conditions of heat exchange and decrease of resistance to evaporation by better moisture removal; feltless drying, wherever possible; completely enclosed paper machines; subdivision of the drier part into several enclosed separate units; completely air-conditioned paper-machine rooms; and additional heaters installed in the drier section, the energy supplied by dielectric heating or infrared radiation). Numerous calculations, 29 illustrations, 5 tables, and 28 references. E.S.

MACHINERY—FELTS

HONAUER, H. The introduction of linen drier felts and operating results obtained with them in the paper industry. Finnish Paper Timber J. 27, no. 17: 247-52 (Sept. 15, 1945). [In Swedish]

Finland's paper industry under normal conditions requires approximately 350 tons of felts per year; the consumption varies between 600 and 700 g./ton of finished paper. The country's only felt mill at Tammerfors produced about one third of the domestic consumption from imported wool and cotton; the remaining two thirds were also imported in the form of finished felts. During the war years, the situation became critical and substitutes

from domestic raw materials were sought; linen received particular consideration. The Tammerfors mill manufactured linen felts which were tried out at the Björneborg paper mill. The results were so encouraging that other mills started to experiment with them; approximately 80 linen felts were in operation in 1945. Data on mill results are given. Additional information is needed, because most machines operated at lowered speeds. Experiments with press felts made of mixtures of wool and linen for pulp drying and paper machines are also under way in Finland. 6 tables and 4 diagrams. E.S.

HONAUER, H. Operating results with linen drier felts. Finnish Paper Timber J. 28, no. 7 A: 26-31 (April, 1946). [In Swedish; English summary]

Continuing his previous article (*cf.* abstract above), the author reports some of the operating results obtained with linen felts in 14 different Finnish paper mills. Data for individual felts are given to illustrate the great difference in felt life and production which may be encountered. Since the price difference between woolen and linen felts is very small, the paper production per kg. of felt can be taken as a measure of the economic feasibility of linen drier felts. Of 71 used linen felts, 22 gave poorer, eight about the same, and 41 better performance than the felts previously used in the mills under discussion. On the average, the linen drier felts gave 17.8% better operating results (calculated for each felt separately) than those used before. Finnish linen felts have thus exceeded expectations and the experiments should be continued. The quality of present felts, however, cannot be appreciably improved until more suitable looms have been imported. 7 tables and 8 diagrams. E.S.

MACHINERY—REFINERS

RENARD, A. Classical and conical refiners. Papeterie 71, no. 7: 242-3, 245, 247 (July, 1949). [In French]

The construction and operation of conical refiners (jordan, Erel, Morden, Jones, etc.) are described, with a mathematical analysis of their action. The possibilities of polycellular refiners (not yet on the market) are discussed. 3 illustrations. L.E.W.

WHITE, W. A., JR. Balanced treatment of papermaking fibers. Paper Mill News 72, no. 35: 9-10, 14-17 (Aug. 27, 1949); Paper Trade J. 129, no. 7: 35-9 (Aug. 18, 1949).

Each type of paper requires an individual analysis in terms of the type and number of machines required for efficient stock preparation. The proportions of the four basic concepts: pulping, defibering, fibrillation, and cutting depend entirely upon the type of paper required and the type of furnish used; certain grades will require more of one treatment than others. "Balanced stock treatment" stands for the balancing of the various factors for obtaining the best sheet of paper with a minimum investment in machinery, power consumption, and labor/ton of paper produced. For pulping, Hydrapulpers; for defibering, Hydrafiners; for fibrillation, a cycling-refining system; and for cutting, jordans are recommended, in combination with central and automatic control (Duotrol equipment). The stock preparation system may be either batch (horizontal or vertical), or continuous; supplemented by diagrams, examples of different hookups for various conditions are given. 19 figures. E.S.

MACHINERY—ROLL GRINDING APPARATUS

JEFFERS, HENRY J. Roll grinding paper mill rolls. Paper Mill News 72, no. 34: 67, 69-70 (Aug. 20, 1949).

Some problems peculiar to the grinding of paper mill rolls are discussed and general directions are given for the operation of the grinding machine, vibration, working speed, finishing cuts, roughing, wheel approach, mounting rolls, lubrication of rests, wheel selection and choice of bonds, coolants, filters, and recommended grit and grade of silicon carbide. E.S.

MACHINERY—SAVE-ALLS

EASTON, PAUL. Sveen Pedersen savealls in board mills and re-use of water. Paper Trade J. 129, no. 6: 37-41 (Aug. 11, 1949); Paper Mill News 72, no. 36: 10, 12, 14, 16 (Sept. 3, 1949).

The principles and operation of the Sveen Pedersen flotation saveall are described. The application of either single or dual systems to board machines making lined grades is explained by a number of examples. 10 diagrams. E.S.

MATERIALS HANDLING

ANON. Stock handling simplified in these plants. Am. Printer 128, no. 7: 40-2 (July, 1949).

The stock-handling procedures of the three printing plants, Kable Brothers Co., the Country Life Press, and A. R. Barnes & Co., are described. The use of battery-powered trucks, overhead cranes, skids, and pallets has simplified this activity. R.R.

BLAKEMORE, FRED T. Thinking about building a warehouse? Am. Paper Merchant 46, no. 8: 32-3 (August, 1949).

A description is given of the new 65,000-sq. ft. warehouse of the Swigart Paper Co., Chicago. The building is on the main line of two railroads and has a five lane, 60-foot, concrete truck dock. Controlled unit heating and humidity systems help assure ideal storage and working conditions. Gasoline and electric fork lift trucks and a gas transporter with a hydraulic pallet lifter facilitate stock handling. Paper pallets have not been found satisfactory. R.R.

TIKHOMIROV, A. M. Mechanization of difficult processes in the pulp and paper industry. Bumazh. Prom. 24, no. 1: 6-16 (January-February, 1949). [In Russian]

This article covers automatic loading of packaged and loose materials, ash removal from stationary bunkers, scaffold bridges for dump trucks, rotary scrapers, and telphers or overhead cranes. Several elevations and layouts are included. E.G.S.

METALLIZING PROCESS

METALLIZING ENGINEERING COMPANY. When machines break down—try metallizing. Paper Mill News 72, no. 34: 75, 81 (Aug. 20, 1949).

The advantages and limitations of repairs by metallizing are described; examples of reconditioning the journals of an 18-ton roll, restoration of worn pump sections, and resurfacing of roll bodies are given. 3 figures. E.S.

METERS AND RECORDERS

BAILEY METER COMPANY. Maintenance of flow meters in the paper industry. Paper Mill News 72, no. 34: 76 (Aug. 20, 1949).

Directions for the routine maintenance of flowmeters are given, including the checking of the chart records, the chart drive mechanism, and the supply of ink in the pen. Care must be taken to select the proper instrument initially and to have it correctly installed in accordance with the manufacturer's recommendations; sustained accuracy can only be obtained by a continuous program of preventive maintenance. E.S.

ZIMMERMAN, G. D. Measurement of slush stock flows. Tappi 32, no. 8: 368-9; discussion: 369 (August, 1949).

The principles and operation of a variable area meter (Ratosleeve meter) are described, which is used to proportion slush stocks, for instance, sulfite and groundwood in a newsprint mill. E.S.

MICROBIOLOGICAL TESTING

CRUICKSHANK, G. A. Evaluation of mold-resisting treatment of paper and paperboard. Tappi 32, no. 8: 370-4 (August, 1949).

Data are presented which indicate that the agar-plate method commonly used for the evaluation of mold-resisting qualities of paper and paperboard may be unsatisfactory in testing lightweight paper. Changing the paper-to-agar weight ratio in the test can yield results varying in interpretation from that of effective mold-resistance to that of no apparent protection. The choice of the test organism, the pH of the culture medium, and the length of the period of incubation can exert a similar effect upon the interpretation of the test. The various factors are discussed in detail and suggestions are offered for the elimination of the foregoing variables. There appears to be a definite need for a standard testing procedure for the determination of mold-resistance of paper. E.S.

MILL MANAGEMENT

BATES, H. E. Preventive maintenance. Paper Mill News 72, no. 34: 38-9 (Aug. 20, 1949).

The author describes the work of the "Mechanical Superintendent" at the Belgo Division, Consolidated Paper Corp., Ltd., Shawinigan Falls, Que., a 48-year-old newsprint mill, employing a total force of 860. The superintendent is in charge of the shops and maintenance and repair personnel, including 210 millwrights, machinists, carpenters, pipefitters, welders, blacksmiths, tinsmiths, masons, painters, oilers, and unskilled laborers. This large crew and the extensive shops are required, because most mills are far from manufacturing centers and the newsprint machines must be kept running from midnight Sunday to midnight Saturday. Necessary repairs and overhauling, wherever possible, must be postponed until Sunday; with careful planning (starting on Thursday) and a good crew, an astonishing amount of work can be done during the 24 hours the machines are down. Brief reference is also made to the number of spares to be kept, inspection schedules, and record keeping for each unit. E.S.

POWLINSON, KEITH. Selecting and training controllership personnel. Paper Trade J. 129, no. 6: 32-3 (Aug. 11, 1949).

Suggestions for improving college instruction and industrial training for controllership personnel are given. The training should be directed primarily

toward the development of social and administrative skills rather than toward the development of mere technical proficiency in accounting. E.S.

NEWSPRINT

ANON. The development of newsprint packaging. Western Pulp and Paper 2, no. 8: 16-17 (August, 1949).

Illustrations depict the development of newsprint packaging by the Powell River Co., from the expensive "barrel wrapping method" to the modern standard pack with special cushioned edges and moistureproof body wrap, which will withstand a variety of shipping, handling, and climatic conditions throughout the world. E.S.

ZIMA, J. J. World production and distribution of newsprint paper—1948. Newsprint Service Bureau Bull. no. 379: 2-3, 5-7 (Aug. 18, 1949); *cf.* B.I.P.C. 18:848.

The results of the third postwar survey of world newsprint production and distribution made by the Newsprint Service Bureau in co-operation with the Forest Products Branch, O. I. T., U. S. Department of Commerce, indicate that the output in 1948 amounted to slightly more than 8,440,000 tons, an increase of approximately 790,000 tons over the 1947 figure and, except for the abnormally high production in 1937, the largest on record. Production in the United States in 1948 was 10% of the world total, whereas the consumption amounted to 62% of the world supply. The country also received 60% of the increase in world supply, the remaining 40% going to consumers elsewhere. Canada's production amounted to 54% of the world total as against 58% in 1947; this decrease in the percentage is the result of the relatively greater increase in production in other countries. Data for production and distribution for the various countries (estimated for Russia and the Soviet Zone of Germany) are given; these show that progress in the balancing of world demand and supply was accelerated in 1948. Throughout the world there exists sufficient mechanical capacity for turning out 10 million tons of newsprint per year; hence, the supply could be most rapidly augmented by greater use of existing facilities. E.S.

PAPER—COATED

MURPHY, E. K., and DAVIS, H. G. High speed coating of reproduction papers. Paper Ind. 31, no. 5: 596-9, 607 (August, 1949); *cf.* B.I.P.C. 19: 254.

An illustrated description of the new Ozalid coating machine and its auxiliaries is given. The Ozalid coating process is, strictly speaking, not a coating, but an impregnation process, in that the sensitizing solution is applied to the paper and allowed to penetrate to a certain predetermined depth, at which point penetration is arrested and the paper dried. The problem of drying paper impregnated with light- and heat-sensitive chemicals with air purified by passage through a Precipitron electrostatic air cleaner is discussed briefly, as well as the sectional electrical drive and control system. L.E.W.

REYNOLDS, A. P. Postwar developments in litho coated papers. Modern Lithography 17, no. 8: 63-5 (August, 1949).

Following a discussion of early difficulties in offset lithography, the author reports on research on offset coated papers. It has been found that if the coating pigment particles are sealed so they cannot absorb water from the blanket, the moisture, which otherwise carries alkalinity from the paper,

cannot reach the plate and react to cause scumming. It is now possible to get coated two-side offset papers made with coating pigments that have a quick affinity for ink vehicle. They hold up the color, allow the vehicle to flow swiftly between them, and greatly minimize offsetting at high speeds. A second development is the use of latex and starch, sometimes combined with casein, in C1S (coated one side) varnish label papers. They are excellent adhesives and permit better printing than the casein used exclusively in the past. New synthetics have recently become available, which are very useful in spirit varnishing and form high-gloss films on even highly absorptive coated papers. The author concludes with a description of tests made on the new papers and mention of factors which must be considered. R.R.

ST. JOHN, EUGENE. Printing on the new glossy hard coated papers. Inland Printer 123, no. 5: 84-5 (August, 1949).

A high-gloss finish is easily attained by the use of enamel-coated papers, such as Kromekote and Warekote, and high-gloss modern printing inks particularly adapted to such stock. Kromekote is a cast-coated paper. While the coating is still wet, the paper is carried around a highly polished chrome-plated drum where enough heat is applied to evaporate the moisture from the coating. The paper acquires a sheen like that of the plated drum without the application of extreme pressure. Because the coating is not crushed by calendering, it yields a cushion surface for good printing with easy make-ready and a higher gloss than is possible with calendering. When transparent inks are used, the sheen of the paper supplies a high gloss to the print. Warekote, the newest of glossy brush-coated papers, has a mirror-like enamel finish. Both Warekote and Chromekote C1S give beautiful results on labels, wraps, catalog covers, book jackets, etc. Kromekote .10 card stock, which has a glossy Kromekote finish on one side and a dull coating finish on the other, is well adapted to such uses as mailing cards and catalog and magazine covers. Suggestions are given for printing this stock. R.R.

PAPER AND PULP INDUSTRY

FLANDER, CARL-ERIC. Conditions in the paper industry of the United States. Finnish Paper Timber J. 28, no. 7 A: 32-4 (April, 1946). [In Swedish; English summary]

The production of paper and board in the United States during the war years is discussed and economical and technical developments during this period are reviewed. Some of the outstanding technical developments include: further expansion of machine coating for paper and board, bleaching of groundwood with sodium peroxide, increased interest in semichemical hardwood pulps, the Roberts grinder, hydraulic barkers, the use of flax straw for cigarette and other fine papers, and the development of a great variety of functional boards and papers, notably the V-boards. E.S.

JAYME, GEORG. The Australian pulp and paper industry. Das Papier 3, no. 11/12: 201-15 (June, 1949). [In German]

A well-illustrated description is given, dealing with the growth and morphological, physical, and chemical properties of eucalyptus woods, and with their utilization in the paper, wood distillation, and tanning industries. Plantations of fast-growing conifers (especially the pines) are discussed briefly, together with those trace elements (primarily phosphorus and zinc), with which Australian soils in certain areas must be enriched for adequate tree growth. 31 footnotes. L.E.W.

[NEUBRECH, W. LEROY] Economic review of pulp and paper industry in the United States. Pulp Paper Mag. Can. 50, no. 8: 75-80 (July, 1949).

This is a reproduction of a large part of the material published in the June, 1949, Industry Report published by the U. S. Office of Domestic Commerce. The section on waste paper, the graphs, and tables are omitted. E.S.

PAPER AND PULP INDUSTRY—EDUCATION

ANON. Three Rivers paper school installs miniature pulp and paper mill. Western Pulp and Paper 2, no. 8: 9 (August, 1949); Pulp Paper Mag. Can. 50, no. 8: 83 (July, 1949).

L'Ecole Provinciale de Papeterie at Three Rivers, P.Q., is adding a small integrated pulp and paper mill to its existing laboratories. The commercial equipment includes a chemical pulp mill, a groundwood mill, a pulp screening and washing section, a stock preparation section, a complete paper machine, and a paper finishing section. The capacities of the various machines have been selected to produce approximately three tons of newsprint per day. The units can operate separately for tests or in series as an integrated mill; all grades of pulp can be made, such as semichemical, sulfite, and kraft pulp, and all grades of paper and board. The project will be completed late in 1949. E.S.

ANON. Your son and the paper industry. Barrell's Paper Annual, 1949-1950: 14-21 [1949]

During the past 50 years, the attitude of the industry has changed from one of distrust to one of complete dependence on scientifically trained personnel. As an aid to young men who are interested in formal training particularly adapted to the industry, a summary is given of educational opportunities available at the University of Maine, the New York State College of Forestry at Syracuse University, The Institute of Paper Chemistry, and Western Michigan College of Education. R.R.

PAPER AND PULP MILLS

ANON. Bowater's complete expansion program at Corner Brook paper mill. Pulp Paper Mag. Can. 50, no. 8: 70-4 (July, 1949); *cf.* B.I.P.C. 19: 258.

Following a brief historical introduction, the recently completed expansion program at the Corner Brook newsprint mill of Bowater's Newfoundland Pulp and Paper Mills, Ltd., is described. The program involved the installation of a new (seventh) newsprint machine with the necessary expansion of groundwood, steam power, and other ancillary requirements. The present productive capacity of the mill is 1100 tons/day, of which 175 tons is unbleached sulfite pulp for sale, and the rest newsprint. Diagrams and illustrations are included. E.S.

PAPER SIZING

TIMGREN, L. The dissolving of aluminum sulfate and the addition of sulfuric acid in the manufacture of kraft paper. Finnish Paper Timber J. 28, no. 7 A: 72-4 (April, 1946). [In Finnish; English summary]

A method for sizing kraft paper is outlined, in which concentrated sulfuric acid (0.5% of the dry weight of the pulp) is used for neutralizing the wet sulfate pulp. An arrangement at the paper mill of Björneborg, Finland, is

described, in which the feeding of the acid, the dissolution of the alum, and the removal of the undissolved residue are carried out in successive stages. The addition of sulfuric acid permits a 65% reduction in the use of alum without affecting the sizing degree of the resulting paper. No corrosion problems are encountered, provided that not more of the acid is used than is required for the neutralization of the pulp. However, this procedure can be applied only in paper mills which use wet alkaline pulps. The method for dissolving the alum (without use of sulfuric acid), on the other hand, presents certain advantages, so that it is recommended for general application. 2 illustrations. E.S.

PAPER SPECIALTIES

ANON. K-C's Memphis mill: modern materials handling. Pulp & Paper 23, no. 9: 53-4, 56 (August, 1949).

Following a summary of the development of the Kimberly-Clark Corp., a description is given of the manufacturing and converting operations in Memphis, Tenn. Two machines produce creped wadding which is converted into Kleenex and Kotex. The new plant, secured from the War Assets Administration, offers space on a single ground floor, instead of the multiple levels of other similar mills. Clark industrial towing tractors and conveyor systems are used in the completely mechanized handling system for everything from pulp unloading to freight-car loading. Until the products are packaged, emphasis is laid on care in handling both from the aspect of sanitation and the cost of damaged rejects. R.R.

ANON. Knowing your papers is the first step to solving your customers' problems. Paper Sales 9, no. 8: 14 (August, 1949).

Coils and spherical objects are best wrapped in a creped spiral paper, which conforms more snugly to the contours than does a nonstretchable wrap. Products such as highly finished steel gears should be wrapped in a noncorrosive greaseproof paper. When such shipments are made by air, care must be taken to exclude all air from the package, which will otherwise rupture at high altitudes. R.R.

ANON. Paper cup cost study graphically reveals fountain savings. Paper Sales 9, no. 8: 23-4 (August, 1949); *cf.* B.I.P.C. 18: 386.

A description is given of the methods used by the Business Research Corp. for a cost study of paper and multi-use dishes in fountain operations; a typical summary sheet is included. Some of the six fountains studied saved as much as $40 a week by using paper service. R.R.

ANON. Tubing and tubular bags. Paper & Twine J. 23, no. 6: 11, 24-6 (August, 1949).

Tubular paper bags are paper tubes with the bottom sealed, usually in turn-up or pinch-bottom style; the sides can be fluted for easy opening. They are made of almost any stock that will not permit the adhesive to seep through. A special adhesive must be used for food packages. The bags are made to order and therefore require careful specifications. In general, flexible paper tubing is classed as flat, fluted, and padded and is available as plain kraft, butted, combined, lined, fluted, duo-tone, overlap, double, and padded tubing, each of which is described. A partial list is given of articles commonly packaged in paper tubing. R.R.

BLEIWEIS, JEROME L. Vaporized metals coat surfaces. Am. Machinist 93, no. 18: 118-22 (Sept. 8, 1949).

A detailed description is given of the equipment and procedures employed in the high-vacuum deposition of metals and metallic derivatives onto glass,

paper, cellophane, etc. A list of usable filament materials and their evaporation characteristics is included. Among the applications listed is the manufacture of paper condensers, produced by coating the rolls of paper with aluminum or zinc. E.S.

JULSON, J. O. Ramblings of a superintendent in a tissue mill—with counsel for other superintendents, too. Pulp & Paper 23, no. 9: 33-4, 101-2, 104, 106 (August, 1949); *cf.* B.I.P.C. 19: 793.

This is the complete text of the article, of which only the first half is given in the previous reference. The additional material covers a rather detailed description of the new tissue paper machine, including the Shartle Selectifier screen, slice setting, wire length, type of table rolls, deflectors, stationery deckles, felt conditioning, suction-press rolls, drying with a Yankee drier, methods for producing flat and creped tissues, doctor-blade preparation and care, slitters, the dust problem, pumps, and the machine drive. The paper-machine description (without the first part of the article) is also published in Paper Mill News 72, no. 30: 28, 30, 32 (July 23, 1949). E.S.

MITCHELL, J. H., JR. Potato chips vs. hot-weather spoilage. Food Industries 21, no. 8: 1051-4 (August, 1949).

An investigation of the flavor preservation of potato chips during hot weather included a study of proper packaging. After 164 hours at 100° F. and 95% R.H., chips packaged in duplex waxed glassine, duplex 300 X 300 MST-54 cellophane, duplex 300 MST-54 X 300 MST-53 cellophane, and foil-glassine or -Rapinwax laminates were still crisp. A folded, stapled seal on a duplex waxed glassine bag was as efficient after two weeks at 100° F. and 95% R.H. as a similar bag which was heat-sealed. Tests on the influence of light on the keeping quality of the chips revealed less change in flavor when a green cellophane bag was used than when colorless or yellow bags were used. Samples stored in the dark had a higher flavor score than those in green bags. At high light intensities, foil bags, cans, or cardboard containers would exclude practically all light and thus give maximum protection. Data are tabulated on the moisture protection given by various types of bags and on the effects of excluding light of certain wave lengths *vs.* excluding all light, using various kinds of bags. R.R.

MUNISING PAPER COMPANY. Self-sealing wax paper developed. Am. Paper Converter 23, no. 8: 20, 25 (August, 1949); Am. Box-maker 46, no. 9: 32-3 (September, 1949).

Wax-Seel, a new self-seal waxed paper, will stick only to itself to form a water- and airproof wrap upon slight manual pressure. It has one adhesive and one cohesive side; the latter adheres only to a similarly coated paper. The new product is suggested for wrapping odorous foods for refrigeration and for retaining the freshness of such foods as crackers, cereals, and bread. R.R.

PAPER SALES. Eating establishments: rich source of multiple paper sales. Paper Sales 9, no. 8: 16-18, 32, 34, 36 (August, 1949).

Because restaurants use such a variety of paper products, it is suggested that the paper salesman group these items according to their use as an aid in remembering them. Selling points are given for such items as paper butter chips, doilies and place mats, spoons and forks, napkins and dispensers, cups and other containers for use in the restaurant and for carry-out orders, baking cups, menu covers, order pads, and restaurant checks. R.R.

PAPER SALES. How and where to sell glassine and greaseproof papers. Paper Sales 9, no. 8: 20-3, 38, 40, 42 (August, 1949).

Included in a discussion of glassine and greaseproof papers is a list of their principal uses and questions and answers regarding the difference between the two products, their manufacture, properties, available laminated combinations, and applications. R.R.

PATENTS

HEINONEN, E. M. Russian patent laws. Finnish Paper Timber J. 28, no. 7 A: 19-26; no. 12: 192-4 (April, June 30, 1946). [In Finnish; English summary]

The development of patent legislation in the Soviet Union since 1919 is reviewed. 7 references. E.S.

PHYSICAL TESTING—FASTNESS TO LIGHT

NORDHAMMAR, G. The conditions of temperature and humidity in the Fade-Ometer. Am. Dyestuff Reptr. 38, no. 16: 571-4, 593 (Aug. 8, 1949).

It was suspected that the fading rate of a Fade-Ometer might be dependent on the number of samples in the apparatus, which might give rise to a difference in the prevailing temperature of the samples; hence, the temperature and humidity conditions in the apparatus were investigated. There was a very significant difference between the values of 55° C. for a full set of 21 samples and the value of about 30° C. for five specimens; all measurements should, therefore, be made with the identical number of samples. In the author's experiments, a full set of 21 samples was always employed, so that the full capacity of the apparatus was utilized. The temperatures, measured by means of thermocouples connected to a recording potentiometer, were rather high compared with those likely to be met in practice; the surface temperature of the sample sometimes exceeded 100° C. The temperature of the air in front of the samples was about 55° C. and the air required considerable moisture for a high R.H. In the FDA-R Fade-Ometer (Atlas Electric Devices Co.) used, the R.H. was only about 10% and depended more on the humidity of the testing room than on the humidifier. By forcing all the cooling air in front of the samples, the temperature can be lowered and the R.H. raised. Some regulation of humidity can be effected by a change in the position of the wet wicks, so that the air is forced through them instead of passing only above them. 10 figures and 6 references. R.R.

PHYSICAL TESTING—PAPER—MACHINE DIRECTION

LITHOGRAPHIC TECHNICAL FOUNDATION. How to find the grain direction of paper. Modern Lithography 17, no. 8: 40 (August, 1949); Am. Printer 128, no. 8: 44 (August, 1949).

Paper tears more easily with the grain, is stronger and stiffer in the grain direction, and expands or contracts more across grain when it absorbs or desorbs moisture. When floated on water or moistened on one side, paper curls toward the dry side with the grain. Two strips of paper cut at right angles to each other from one sheet of paper, placed one above the other in turn while they are held horizontally by one end, will show grain in that the strip that bends down most when it is on the bottom has the grain running crosswise. If a score is made along the width and length of a sheet with a blunt point, the smoother score will be in the grain direction. R.R.

PHYSICAL TESTING—PAPER—PRINTABILITY

ZETTLEMOYER, A. C., ECKHART, C. G., and WALKER, W. C. Printing ink-paper relationships: an introduction to ink mileage. Am. Ink Maker 27, no. 8: 23-6, 57, 59 (August, 1949).

Following a review of the literature concerning the relationship of printing ink to paper, particularly with regard to printability, a report is given of research conducted at the National Printing Ink Research Institute. When commercial black inks were tested for mileage on commercial papers, it was found that, generally, the greater the paper porosity and the higher the reflectance of the bulk ink, the lower are the ultimate print blackness and the mileage obtained. A theoretical equation is presented relating the reflectance of solid prints to film thickness for any ink-paper combination. The equation can be expressed linearly for evaluating the constants involved and estimating the mileage at any desired blackness. The constants of the equation have physical significance and aid the discussion of ink mileage. 5 tables, 3 figures, and 17 references. R.R.

PHYSICAL TESTING—PAPER—WET STRENGTH

BRECHT, WALTER. The tensile strength of the paper web in the paper machine. Das Papier 3, no. 11/12: 189-92 (June, 1949). [In German]

Experiments on a slow-running commercial paper machine (speed 45 m./min.) are described, in which the furnish contained about 60% waste paper and 40% groundwood pulp. Taking samples (strips 15 mm. in width) from the web at various stages of the operation, the breaking load in grams in the machine (I) and cross-machine (II) directions was determined. Various samples were taken between the final suction box up to and including the winders, the water percentage varying from 92.1 to 5.5%. In the sample with highest water content, (I) was 15 grams and (II), 13 grams, whereas for the dry paper (I) and (II) were 4480 and 1790 grams, respectively. After the second wet press (prior to entering the drier section), (I) was only 770 grams whereas, after passing the first three driers, (I) rose to 2440 grams after which the rise was less marked, and the ratio of (II) to (I) remained approximately constant at 0.4. When the finished sheet (containing 7.2% water) was immersed in water for periods ranging from one second to five hours, the water content reached a maximum of 48.8% with (I) equal to 420 grams, i.e., about 9.2% of the initial (I). Unexpectedly, at a definite water content, the rewetted samples usually showed far lower (I) values than did samples taken from the paper web during machine operation. Methods of taking and handling samples are discussed only very briefly. 2 tables and 2 diagrams. L.E.W.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Wet tensile breaking strength of paper and paperboard. Tappi 32, no. 8: 60-1A (August, 1949); *cf.* B.I.P.C. 14: 326.

A revision of TAPPI Tentative Standard T 456 m-44 is presented. E.S.

PHYSICAL TESTING—PULP

IVANOV, S. N. A new method of quality control of paper pulp. Bumazh. Prom. 24, no. 2: 11-15 (March-April, 1949). [In Russian]

In a discussion of freeness testers, it is pointed out that the Schopper-Riegler, Williams, Green, Canadian standard, and other similar instruments, all have the same basic deficiency; that is, determinations made with these testers are relative rather than absolute. An evaluation of fiber-measuring instruments is given; none of the existing instruments are regarded as satisfactory because of their subjectivity, tediousness of operation, and unsuitability for use in production. The author describes an instrument and method

which he has developed for average fiber length determination; the method is rapid (2-3 min.), is accurate to 0.01 mm., and is free from subjectivity. Drawings, data, and graphs are included. E.G.S.

PHYSICAL TESTING—PULP—STRENGTH

BACKMAN, ALBERT. The characterization of the state of beating of pulps. Finnish Paper Timber J. 28, no. 7 A: 35-52 (April, 1946). [In Swedish; English summary]

The usual method for evaluating the strength properties of a pulp involves the determination of its strength at a certain degree of beating or freeness. However, this procedure does not give a true characterization, since it is incorrect to consider one pulp inferior in strength to another because it requires a different degree of beating to attain the identical strength. The various methods used for evaluating the beating effect are reviewed briefly, including water absorption, water retention, surface area of fibers, drainage time, porosity, and apparent density; none of them is considered satisfactory. The author introduces a new criterion for pulp evaluation as follows: For example, a point is chosen on the curve for tensile strength *vs.* time of beating for a given pulp. At this point a relationship is developed known as omega B. First the slope of the curve at this point is determined. Then the slope of a line connecting this point to the origin of the axis is determined. The quantity omega B = 100 [1-(the slope of the curve at this point ÷ the slope of the line from the point of the origin)] The value for this expression is 100 at the point where the curve passes through a maximum. It has been found convenient to compare the various properties of a given pulp with those of another pulp at the beating times corresponding to omega B = 80 for both pulps. The reliability of the results which are obtained with different pulp samples is compared when using degrees S.-R. (50), porosity (Bekk-Ullstein number of 200 seconds), apparent density (0.800), and omega B of the breaking length curve (80). The omega B analysis is found to have definite advantages over the other methods; no special instruments or additional testing procedures are required. The results of a pulp evaluation on the basis of omega B do not depend upon its drainage properties; these can be measured separately. In the author's opinion, the best characterization of a pulp is obtained when the two different values are taken into account—properties at S.-R. 50 and properties at omega B = 80. 19 footnotes, 36 tables, and 24 diagrams. L.V.F.

PIGMENTS

WILLETS, WILLIAM R. Titanium pigments in coating. Tappi 32, no. 8: 349-56 (August, 1949).

The beneficial results of pigmenting typical paper coatings have again been demonstrated by the presentation of data previously not available in the literature. Such pigmentation results in improved brightness, color, and opacity, decreased show-through, and better printability. About 2.5 parts of rutile titanium calcium pigment are equivalent to 1 part of anatase titanium dioxide in producing such improvements. The rutile titanium calcium pigment has been shown to be considerably more effective than titanium barium pigment (the manufacture of which has been discontinued). Pigmentation of typical coating mixes did not alter their rheological properties. The gloss obtained with pigmented coatings on calendering was at least as good as the gloss obtained with unpigmented coatings. The cost of pigmentation of printing papers will depend on the final basis weight of such papers, the amount of coating applied, and the extent of pigmentation, but will vary from about $2.00 to $8.00 a ton. In the case of coated paperboards, the cost will also

vary with the weight of the board, the amount of coating applied, and the extent of pigmentation from about $1.00 to $3.00 a ton. The rutile titanium calcium pigment offers definite economic advantages over titanium barium pigment, and some advantage over titanium dioxide. 3 tables, 9 figures, and 6 references. E.S.

PINE

KOVALEV, V. P. Utilization of pine for wood-pulp production. Bumazh. Prom. 24, no. 2: 27-31 (March-April, 1949). [In Russian]

The author has made a study of resin removal in the processing of pine to wood pulp and thence to paper and board; the work was done in the TNIIB laboratories (Central Scientific Research Institute of the Paper Industry). Papers made from various proportions of pine and spruce groundwood pulps and unbleached chemical pulp are compared as to thickness, weight, density, moisture content, tearing strength, stretch, folding endurance, and resin content. 4 tables. E.G.S.

WECK, J. The Murray pine. Svensk Papperstidn. 52, no. 13: 340-1 (July 15, 1949). [In Swedish]

European experience with the acclimatization of the North American Murray pine (*Pinus Murrayana*), particularly in Scandinavian countries, is described. When planted in the correct soil (clay soil or clay-sand mixtures), the species exhibits an astonishing growth increment, as shown by the following data taken from the oldest Murray-pine plantation in Europe (southern Finland). The stand is now 40-50 years old and, as far as the Murray pine is concerned, at its height of industrial usefulness. When the stand was 30-40 years old, the following total yield was determined: spruce, 160, domestic pine, 207, and Murray pine, 320 cu. m./hectare. The possibilities of Murray pine as a pulpwood and its high resistance to fungi are emphasized; it does not grow well on acid or swampy sites or on very dry soil. E.S.

PLASTIC FILMS (NONCELLULOSIC)

ANON. Disappearing package. Modern Packaging 22, no. 12: 81 (August, 1949); *cf.* B.I.P.C. 19: 718.

S-polymer thermoplastic film bags are used to package carbon black for the rubber industry. They are put unopened into Banbury mixers where they are disintegrated and incorporated into the rubber mix. The use of the bags promotes cleanliness, eliminates waste, carbon black contamination, and the problem of bag disposal, and makes carbon black addition more convenient. Black multiwall kraft bags sealed with gummed tape are used as outer coverings. It is believed that the S-polymer film will be widely applicable to other packaging fields. R.R.

IMPERIAL CHEMICAL INDUSTRIES LTD. *Plastics Division.* "Alkathene" layflat tube and film. Brit. Packer 11, no. 8: 35, 37 (August, 1949).

"Alkathene," a polyethylene film, is available as sheeting and layflat seamless tubing in continuous lengths. It is easily heat sealed by the proper methods, which are described. Because it is the lightest plastic known, it has an advantage over other plastics when considered on a cost-per-pound basis. It has good transparency, high resistance to water, water vapor, and chemicals, remains flexible at temperatures as low as —60° C., is unaffected by ordinarily severe conditions, and can be printed with special inks. It is suitable for packaging foods, chemicals, metal components, etc. R.R.

SOUTHWICK, CHARLES A., JR. Polyethylene: uses and prospects. Modern Packaging 22, no. 12: 117-21, 166, 168 (August, 1949); *cf.* B.I.P.C. 19: 798-9.

Polyethylene was originally produced in the United States because of its excellent electrical properties; a large portion is still used for electrical purposes. The majority of commercially produced polyethylene resins have a molecular weight of 20,000. They are similar in composition and molecular arrangement to the paraffin waxes, except that the molecule is much larger. Melting points, tensile strength, insolubility, and hardness increase with molecular weight, which can vary from 1000 to 40,000. Polyethylene with a molecular weight of 20,000 has optimum properties and costs less than resins of higher molecular weights. These resins are lightweight, do not need a plasticizer, additive, or modifier (although an antioxidant should usually be added when they are exposed to high temperatures) and are odorless, tasteless, and chemically inert. Because they are heat-stable and have relatively low working temperatures, they are most easily shaped by heat. Solvent solution is limited to the production of films or paper coatings. Polyethylene is being used for frozen food containers, caps, bottles, liners for multiwall bags, fiber and metal drums, cartons, cases, and coatings and modifications for fibrous or absorptive bases. Sheeting from 4 to 30 mils thick can be made on heated roll systems, and continuous tubes, rods, sheaths over wire, and wide sheeting can be produced by extrusion. Thin film is almost transparent; the more quickly it is cooled as it is extruded, the less hazy the film. Unsupported film can be heated to give seals as strong and protective as the film itself; special sealers and technique are required. Cold adhesives usually make a rather weak, peelable bond which takes time to set. Some excellent laminating agents give good bonds between polyethylene film and aluminum foil and other films. Although polyethylene is being multicolor printed, the inks are not proof against rubbing or severe distortion. Because its greatest disadvantages are lack of great strength, printability, and means of handling it alone, polyethylene film is used in laminates with or supported by paper, cloth, or other film. Data on the properties of the resin are tabulated. R.R.

PLASTICS—FILLERS

CLARK, T. F. Agricultural residues in plastics. III. Evaluation of residue flours as fillers in thermosetting phenolics. Modern Plastics 26, no. 12: 111-15, 164-5 (August, 1949); *cf.* B.I.P.C. 16: 406.

A report is given on an investigation and evaluation of 22 residue flours as fillers in thermosetting phenolic molding compounds. Resin-flour ratios were 50:50 and 40:60; the resin was a commercial two-stage phenol-formaldehyde compound. Three commercial general-purpose molding compounds were also evaluated for comparison. Tests were made on flexural and tensile strength, Izod impact resistance, water-absorption on 24-hour immersion, specific gravity, Rockwell hardness, absorption in boiling water, and resistance to cracking. Almost all the flours tested, including nut and fruit-pit shells, can be used as fillers for products with characteristics meeting A.S.T.M. requirements for general-purpose phenolic molding compounds. 4 tables and 1 figure. R.R.

PLASTICS—PAPER-BASE

PITZER, J. C. Paper properties influencing quality of laminates. Tappi 32, no. 8: 382-4 (August, 1949).

Several properties which can be varied in the manufacture of a saturating paper show a marked influence on the quality of the finished laminate. Among

these properties are: furnish, slime or shives, apparent density, formation, and strength. Illustrations indicate that such laminate qualities as heat resistance, blistering tendencies, and punching are affected by one or more of the above paper properties. Test data are given to indicate that qualities which can be measured quantitatively, such as water absorption, bonding strength, and flexural strength, are influenced by paper properties, especially under certain conditioning procedures. 2 tables and 3 illustrations. E.S.

PLASTICS—TESTING

QUACKENBOS, H. M., JR., HILL, J. M., JR., and STAFF, C. E. The significance of the Charpy and flexure tests in evaluating the impact resistance of plastics. ASTM Bull. no. 159: 56-62; discussion: 62-5; TP116-25 (July, 1949).

A Charpy impact test can be made in such a way that the extraneous energies (end-effects and machine losses) are absent and the test result represents only the energy expended to break the specimen. This test result has been determined for notched and unnotched bars of thermoplastics and laminates at various velocities of impact and has been compared with the area under a load-deflection curve in flexure. Between 0 and 4 ft/sec. there may be a great change in energy to break, but the effect of velocity is slight in the practical impact range (between 4 and 11 ft./sec.). Breakage involves separation into two pieces but damage by cracking or deformation may often precede such separation. Energy for such damage can sometimes be best deduced from a flexure test. Possible impact testing methods for all plastics are considered in the light of these findings taken in conjunction with present knowledge of the thermosetting plastics. Two procedures are recommended over the present Izod test, and both notched and unnotched bars should be used in each: (*a*) a Charpy test, and (*b*) a mixed Charpy-flexure test (impact resistance). 11 references. E.S.

SEIDEL, M. P. Influence of resin bonds on the water immersion stability of paper base laminates. Tappi 32, no. 8: 374-7 (August, 1949).

The weight and volume changes which occur as a result of the water immersion of kraft paper-base, phenolic resin-bonded laminates have been studied. These changes are relatively independent of molding temperatures in the range of 150 to 180° C. but are markedly influenced by the resin condensation catalyst. 5 tables and 11 diagrams. E.S.

POWER, HYDRO-ELECTRIC

BLOMQVIST, ERIK. Sweden's water power, potential and harnessed. Finnish Paper Timber J. 28, no. 7 A: 13-17 (April, 1946). [In Swedish; English summary]

The author reviews the water-power resources of Sweden, the extent to which they have been harnessed, and plans for future developments. Construction problems are discussed. Extensive experiments are under way for changing future high-voltage transmission lines from alternating to direct current; the latter might permit underground cables, thus reducing the number of unsightly overhead lines and towers and introducing other economies. E.S.

PREHYDROLYSIS

ALSFELD, M., and BLASER, B. The recovery of pulp and furfural from annual plants. Chem.-Ztg. 66, no. 33/34: 357-9 (Aug. 19, 1942). [In German]

Reference is made to several German publications dealing with the possibilities of prehydrolysis for obtaining satisfactory pulps and solutions rich in pentoses. Preliminary experiments conducted by the authors indicated that an acid prehydrolysis with 0.5% sulfuric acid for three hours at 120° C. was suitable for extracting 50-80% of the pentosans, the removal of which is necessary for producing a satisfactory pulp in the following alkaline cook. If less pentosans were removed, the resulting pulp had too high a lignin and pentosan content; if more than 80% were removed, the degradation of the cellulose was too drastic. In semicommercial experiments, rye straw and oat hulls with 8-14% moisture were used; the acid hydrolyzate contained 16.4-22.8% furfural. The alkaline straw cook, followed by a hypochlorite bleach in two stages, yielded 33-34% high-grade pulp with 92.6-95.7% α-cellulose. The processing of the acid liquor for furfural was carried out according to Alsfeld's German patents 699,944 (Nov. 14, 1940) and 714,956 (Nov. 20, 1941). The pentoses present in the hydrolyzate yielded 51% furfural; 41% remained unchanged and 8% decomposed to insoluble products. Referred to airdry straw with 12-14% moisture, 5-7% furfural were obtained; by repeated treatment it may be possible to raise the yield to a maximum of 9%. E.S.

PRINTING AND PRINTER'S INK

ANON. Moisture-set inks. Printing Equip. Engr. 78, no. 5: 57-8 (August, 1949).

Moisture-set inks are used increasingly, especially in packaging and paper converting. Their application in the publication field has not been too successful, although development work is progressing. They are formulated with a synthetic-resin base dissolved in a fairly stable organic solvent, which must not only dissolve the resin, but also be miscible with water so that, upon dilution with moisture, the water-insoluble resin precipitates. The inks resemble oil-base inks and have the same consistency, but are relatively odorless. Ink left in partly consumed cans will not skin if the can is carefully closed. This nonskinning quality means that fountains need not be cleaned after a day's run and ink can be left on the ink table and rollers. Moisture-set inks can be used only with rubber rollers, unless a protective coating is applied to the glue and glycerin rollers for an emergency or a single run for a particular press. They dry to a dull finish with moderate sheen and much more quickly than oil inks, except for those which dry at high temperatures. Although live steam was first used to supply the moisture for setting them, more of these inks are now run on presses not supplied with steam units than on presses so equipped; some converters prefer a high moisture content in their stock. The steam equipment is described and the cleaning of rollers, ink plates, and fountains briefly considered. R.R.

CARLSSON, GÖSTA E. Paper, ink, and printing result. Grafiska Forskningslaboratoriet Medd. no. 20: 3-22 (May, 1949). [In Swedish; English summary]

The author discusses the present knowledge of the paper-printing ink relationship; whiteness, smoothness, amount of ink required, absorptivity, and hardness are listed as the outstanding paper properties, which exert an influence upon the printed result. Special reference is made to the study of the rheology of printing inks (viscosity, yield value, thixotropy) and surface-tension phenomena carried out in different research laboratories. E.S.

PULP AND PAPER—IMPURITIES

STRACHAN, JAMES. The abrasion of metal printing surfaces by sand in printing paper. Parts II and III. Paper-Maker (London)

118, no. 1: 30-1; no. 2: 94, 96 (July, August, 1949); Paper Market: 16-17 (July, 1949); *cf.* B.I.P.C. 19: 650.

Newsprint contains an average of 0.5% of sand; rag papers, 0.002-0.005%; esparto papers, 0.1%; and sulfite papers, 0.2-0.3%. The author postulates on the basis of microscopical examinations, that quartz particles with their sharp edges adhere more strongly to the softer chemical wood pulp and esparto fibers than to the harder cotton and linen fibers. Paper made from straw cooked by the soda process possesses a similar sand-carrying capacity to paper made from soft-beaten sulfite pulp, whereas straw paper made from pulp cooked by the sodium sulfite process includes freer and harder fibers with a sand-carrying capacity resembling esparto. From the printer's viewpoint, paper having a minimum content of abrasive particles is highly desirable; the author suggests the establishment of a standard of not more than 0.002% of quartz sand, whose particles should not exceed 0.01 mm. in diameter. Three things are necessary to achieve such a standard: (1) exclusion of sand from all raw materials going into the beater, (2) careful control of fresh-water purification, and (3) filtration of all air entering the mill. Whereas the first two factors are easy to control, an adequate plant for filtration of all incoming air in a paper mill is still fairly uncommon. In conclusion, the author describes methods of analysis for sand in paper and discusses the movement of abrasive particles during printing, which causes grooving of the printing plates. In some printing plants, particularly with rotary presses, the surface of the paper is continuously dusted or brushed immediately before the impression of the printing surface, which is quite effective in the case of rough-finished papers. E.S.

RADIOACTIVITY

WEBB, J. H. The fogging of photographic film by radioactive contaminants in cardboard packaging materials. Phys. Rev. 76, no. 3: 375-80 (Aug. 1, 1949).

Following the detonation of the experimental atom bomb at Alamogordo, New Mexico, on July 16, 1945, a radioactive contaminant was encountered in strawboard material used by the Eastman Kodak Company for packaging photographic sensitive films. This paperboard was manufactured in a mill situated at Vincennes, Indiana, on the Wabash River. A run of strawboard, produced on August 6, 1945, showed this new and unusual type of radioactive contaminant. X-ray film packed with this board showed fogged spots after about two weeks' exposure. Measurements of the contaminated spots of strawboard showed no alpha-activity but fairly strong beta-activity. Absence of alpha-activity ruled out naturally radioactive materials. Measurements of the beta-activity showed a maximum energy of about 0.6 Mev. and a half-life of approximately 30 days. Radiochemical studies of the active ash from the strawboard indicated that the material was of the rare earth series. The energy value and half-life of the beta-radiation are compatible with the isotope Ce^{141}. All studies point to the conclusion that the radioactive contaminant was an artificially radioactive material which found its way into the mill through the river water. The most likely explanation seems to be that it was a wind-borne fission product derived from the atom-bomb detonation in New Mexico on July 16, 1945. E.S.

RAYON—ACETATE PROCESS

SKEEN, JOHN R. Cellulose acetate rayon. Chem. Eng. 56, no. 8: 303-4 (August, 1949).

The history, wartime developments and difficulties, present trends, and the

economics of the rayon acetate process are reviewed. Cellulose acetate rayon accounts now for nearly 6% of the consumption of the major textile fibers—cotton, wool, and rayon. It consumed 227 millions of pounds of cellulose in 1948 (source not given). Recently, the industry has been operating at less than 60% capacity. E.S.

RESEARCH

HOLT, L. Progress in silvicultural research. Pulp Paper Mag. Can. 50, no. 8: 124, 126 (July, 1949).

The present status of silvicultural research in Canada is discussed briefly. E.S.

KOROLEFF, A. Our prospects for woodlands research. Pulp Paper Mag. Can. 50, no. 8: 122, 124 (July, 1949); *cf.* B.I.P.C. 18: 864.

A brief report on the activities of the past year is presented, with particular emphasis on the need for the formation of a definite research program. E.S.

RESEARCH LABORATORIES

ANON. The dedication of the central laboratories of the Swedish Forest Products Laboratory. Svensk Papperstidn. 52, no. 12: 307-19 (June 30, 1949). [In Swedish]

The central laboratories of pulp, paper, groundwood, wallboard, and the graphic arts were officially dedicated on June 17, 1949; the opening speeches (p. 307-12), illustrations of the laboratories (p. 313-16), and a description of the electrical installations (p. 317-19) are given. A different description of the dedication is given in Norsk Skogind. 3, no. 6: 157-9 (June, 1949). E.S.

ANON. Research work in mechanical and chemical wood technology in Finland. Finnish Paper Timber J. 31, no. 12: 201-11 (June 30, 1949). [In English]

The scope of activities of the Finland Institute of Technology (Helsingfors), the Institute of Wood Chemistry at Åbo Akademi (Åbo), the wood technical laboratory of the State Institute for Technical Research (Helsingfors), and the Centrallaboratorium A. B. (Helsingfors), the last-named a research institute of the Finnish industry, is outlined. Illustrations accompany the text. E.S.

DU PONT DE NEMOURS, E. I., & COMPANY. Great American research laboratories. Barrell's Paper Annual, 1949-1950: 6-13 [1949]

A history is given of the development of research by E. I. du Pont de Nemours and Co., which now has 36 research laboratories in 11 states employing 1800 technically trained research workers. Each of the 10 manufacturing departments has its own research divisions. In addition, there are a strong central Chemical Department, a central Engineering Department, and the Haskell Laboratory of Industrial Toxicology. Research is divided into three classes: improvement in commercial processes and products, the development of new processes and products and new uses for old products, and fundamental research without regard to specific commercial objectives. Of particular interest to the paper industry is the summary of various products and processes originated for the industry in the paper laboratory of the Grasselli Chemicals Department, the Electrochemicals Department, the Organic Chemicals Department, and the Pigments Department. R.R.

RESIN, SYNTHETIC—IDENTIFICATION

ERNST, W., and SORKIN, M. Determination of the quantity of synthetic resin upon the fiber. Textil-Rundschau 4, no. 7: 237-47 (July, 1949). [In German]

A number of qualitative and quantitative tests for urea- and melamine-formaldehyde resins in textiles are given. Formaldehyde is detected by the phloroglucinol or carbazole tests on the hydrolyzate produced with hot 5% sulfuric acid. The determination of formaldehyde follows distillation from 5% sulfuric acid solution. Ammoniacal silver nitrate solution plus sodium hydroxide is added to the distillate, and the amount of formaldehyde is estimated from the time required for the solution to develop a specified color. For the urea and melamine tests, the sample is extracted with water to remove ammonium salts, and then is digested with 5% sulfuric acid. A few drops of sodium hypochlorite solution are added to the acid solution; a permanent turbidity indicates melamine. The acid extract is made alkaline with sodium hydroxide, and sodium hypochlorite is added; an evolution of gas indicates urea, thiourea, or proteins. The solution becomes orange-colored on heating to 70-90° C. if melamine is present. The original material also turns to an orange color in the presence of melamine if heated to 70° C. with dilute sodium hypochlorite solution. Thiourea is detected by adding copper sulfate solution to the acid extract (blue-green turbidity), or by heating the extract or the original material with dilute sodium hydroxide, acidifying, and adding copper sulfate solution (brownish-black precipitate). Proteins are detected by the biuret reaction or by the yellow color produced with concentrated nitric acid. The extractable constituents, corresponding to the maximum possible resin content, are determined by the loss in weight of the specimen after digestion with 3% hydrochloric acid for three minutes at 90° C., or after repeated 20-minute digestions at 90° C. with 1-25% acetic acid. A quantitative test for melamine is based upon digestion of the specimen with 5% sulfuric acid and addition of sodium hydroxide or sodium hypochlorite to the cooled extract. The color produced is compared with that of standard dye solutions, which have been established to correspond with known quantities of melamine. The quantitative method described for urea is based upon measurement of the volume of nitrogen evolved upon treatment with sodium hypochlorite. A special gas-measuring tube is shown. Other color tests described are based on the fixation of copper from cuoxam solutions by fibers not containing resins, modification of the ammoniacal silver nitrate test for formaldehyde and differentiation of resin-treated and untreated fibers by picric acid and various dyestuff mixtures. 4 tables, 5 figures, and 17 footnotes. B.L.B.

ROSIN

CALLAHAN, T. PAT. Plastic bottle factor in new process. Chem. Inds. 65, no. 2: 264, 266 (August, 1949); *cf.* B.I.P.C. 17: 436-7; 18: 259-60.

The stimulation of gum flow by means of sulfuric acid is greatly aided by the use of 16-ounce polyethylene bottles, from which the highly corrosive chemical can be sprayed safely on a fresh streak on the tree. With the acid treatment it is only necessary to chip through the bark to the surface of the wood; under the old techniques, the cut had to be much deeper. E.S.

SANDERMANN, W. Balsam obtained by chemical stimulants, its properties and conversion. Chem.-Ztg. 66, no. 7/8: 70-3 (Feb. 18, 1942). [In German]

The balsam obtained by stimulating its flow with chemicals according to Hessenland's procedure (*cf.* B.I.P.C. 6: 187) contains up to 0.1% free hydro-

chloric acid, which slowly combines with the turpentine fraction (mainly). The rate of combining decreases with increasing water content, so that commercial products may be free of the acid or contain small amounts of it. Sulfuric acid does not combine. The presence of free and (to a smaller extent) combined hydrochloric acid does not affect the yield or quality of turpentine on distillation of the resin, but causes the disappearance of *l*-pimaric acid and isomerization of the residual colophony to a product which crystallizes readily. This is undesirable for most purposes. Hessenland recommended the addition of sodium bicarbonate to colophony to prevent crystallization; however, this procedure is too complicated for commercial use. Free hydrochloric acid can be removed before distillation by adsorbents (fuller's earth, bentonite, etc.) or by treatment with alkalies (sodium hydroxide, sodium bicarbonate, etc.), followed by decomposition of the resinates with carbon dioxide under a pressure of 5 atm. For paper sizes, the addition of alkali during distillation is sufficient; the alkali treatment and washing with carbon dioxide can be omitted. 11 references. E.S.

SAFETY

BOERNER, B. J. Safety in the folding paper box industry. Shears 49, no. 680: 8-9, 18 (August, 1949).

Figures from the National Safety Council place the folding paper-box industry among the 10 most hazardous industries in the country. Such a reputation means poor management and results in high workman's compensation insurance rates and difficulties when the labor supply is tight or competition is keen. The small size of most folding paper-box plants and the comparatively high percentage of unskilled labor are contributory factors. Small companies which cannot afford safety directors should use the services of the National Safety Council. A low accident rate for any individual company will result in a credit rating which will lower that organization's insurance costs. Industry-wide activity should be considered because insurance rates and public relations in general will improve with a better safety record. R.R.

FISHER SCIENTIFIC COMPANY. How to prevent accidents in the laboratory. The Laboratory 16, no. 3: 58-66 (1946); Paper-Maker (London) 117, no. 6: 398-400, 402 (June, 1949).

The hazards peculiar to almost all laboratories are discussed under the headings: storage risks, handling risks, faulty techniques, electrical shock, burns, toxic fumes, poisons, fires, explosion, and disposal risks. E.S.

VRANEK, ANTHONY O. Corrugated box plant safety. Shears 49, no. 680: 26-7, 29 (August, 1949).

When management has done everything possible to establish safe working conditions, further progress in accident prevention can be made only by making safety a habit of the individual employee. Personal contact between workers and a foreman who handles his crew well and has the confidence of management is invaluable. A union-management safety committee, publicity, the analysis of lost-time accidents, and training programs are suggested. R.R.

SCALE MODELS

PATCH, C. E. Scale models aid wood handling problems. Paper Ind. 31, no. 5: 606-7 (August, 1949).

By means of two examples, the author shows how scale models may be helpful in studying operating problems; both examples deal with simplifications of wood-handling procedures. E.S.

SHIPPING CONTAINERS

LARDNER, FRED. Shipping container standardization program started; groceries first. Packaging Parade 17, no. 199: 73-4 (August, 1949).

The shipping container standardization program, as it is related to groceries, is concerned with obtaining shipping containers best designed to fit into palletized shipments, employing standard pallets. Industry representatives will be asked to determine unsuitable lines of packaging, specify what is wrong, and recommend changes. Shipping containers may need redesign because of their size and shape, structural features, or the uses to which they are put. Because the shipping container does not reach the consumer and is seldom on display in retail stores, there is little need for emphasis of its sales value. R.R.

RIGID CONTAINERS, LTD. Live chicks delivery containers. Paper Container 61, no. 2: 43 (August, 1949).

The "L.J.B." chick box, a 50-size container, consists of pieces of board cut and scored to make the container and lid easy to assemble and firm during transit. It can be assembled without any fastening means other than that supplied by the design and is so constructed that the contents are kept away from the sides of the box to allow sufficient ventilation through the apertures. The lid has vents which can be left half or completely open. The Burditt draftproof live chick box is half the size of the other box, but has its main advantages. It is said to be the only chick box with air entering at the bottom and leaving at the top. The ventilating holes are staggered and the lid is designed to permit variation of outgoing air with hot, normal, cold, and very cold weather. Both containers are made of corrugated fiberboard and are protected against direct penetration of air and rain. R.R.

SHIPPING CONTAINERS—EXPORT PACKAGING

RYAN, JOHN. Packaging for export. Paper Box Bag Maker: 9-10 (July, 1949).

The two main features of export packaging are protection and assistance in marketing. British exports, like American, suffer from excessive damage because of inefficient packaging. Shipments to humid climates and those which may be stored in the open should be protected by properly sealed waterproof or moisture-vaporproof liners and/or wraps. The packages should be designed with the artistic tastes of the consumers and the methods of selling and display used in the country of designation in mind. R.R.

U. S. OFFICE OF INTERNATIONAL TRADE. Office of International Trade refutes results of surveys. Packaging Parade 17, no. 199: 63-4 (August, 1949).

Figures just released indicate that about 8% of all export shipping is a total loss or must be salvaged because of faulty packing. It is asserted that American manufacturers are losing business abroad as a result of this situation. U. S. exporters who recently conducted surveys among importers throughout the world found that, with only a few exceptions, goods arrived undamaged. The OIT lists the following points for consideration before placing orders for export containers: the nature and value of the goods to be shipped; unloading facilities at the discharge port; inland transportation of the destination country; climatic conditions en route; trans-shipping which may be required; and pilferage hazards. R.R.

SHIPPING CONTAINERS—MULTIWALL BAGS

ANON. Paper bag success story. Packaging Parade 17, no. 199: 40 (August, 1949).

"Palco Pete's Mulch," a shredded redwood-bark soil conditioner produced by The Pacific Lumber Co., is now being packaged successfully in a special Bemis multiwall bag consisting of two walls of heavy-duty kraft and an inner impregnated moisture-vaporproof paper liner. The top closure of the filled bag is reinforced with sewed 90-pound creped kraft tape. The bag is suitably decorated and printed with the necessary information regarding the product and its manufacturer. Earlier packages were penetrated by the moisture in the product, which damaged the mulch and caused the bags to lose their strength and rupture. R.R.

SHIPPING CONTAINERS—PALLETIZING

ANON. Palletizing incoming raw materials. Packaging Parade 17, no. 199: 68, 78 (August, 1949).

Wax, received by S. C. Johnson & Sons, Inc., Racine, Wis., in thin-gage metal drums and as 16- to 20-pound slabs, has been troublesome and expensive to handle. A large two-piece telescoping corrugated container of 275-pound-test board is now used with a corrugated fiberboard pallet for shipping the slab wax. The combination maintains the cleanliness of the wax, eliminates handling losses, and reduces the time necessary for unloading and storing a carload of the product by 8.5 man hours. The new packaging and shipping methods have improved the supplier's operations and reduced his costs to the extent that a price reduction of 0.5 cent per pound has been made. R.R.

SHIPPING CONTAINERS—TESTING

LINCOLN, W. B., JR. Performance standards . . . pro and con. Shears 49, no. 680: 20, 23-4 (August, 1949); Packaging Parade 17, no. 200: 77, 79 (September, 1949); Fibre Containers 34, no. 9: 60-2, 67-8 (September, 1949).

The author outlines the ways in which package-performance standards will benefit the shipper, industry, the purchaser, and the carrier. Freight-classification rules must be minimum rules to cover the numerous items necessary and must be acceptable to shippers, container manufacturers, and carriers. The container manufacturer can be responsible only for the characteristics of what is purchased from him and cannot insure the standard performance of the finished package, which may, for example, include inner packing from another source, be used for a product for which it was not originally intended, etc. The introduction of performance standards requires recognition of the need for container evaluation as a separate operation in some cases. R.R.

TOULOUSE, JULIAN HARRISON. Performance testing of packages in relation to handling and shipping. ASTM Bull. no. 159: TP110-12 (July, 1949); Shears 67, no. 681: 27, 29, 37 (September, 1949).

The author, the chairman of the Subcommittee IV of the A.S.T.M. Committee D-10 on Shipping Containers, attempts to show the widespread ramifications of testing in relation to handling and shipping, where all types of hazards are involved, such as dropping, tumbling, throwing, vibration, and load bearing. Particular stress is placed on the need for establishing levels of size and weight on each of the tests thus far developed which apply to performance of packages. Various weight classifications are under consideration, with such brackets as 0-50 pounds (with a possible subbracket inside the range of 0-20 pounds), 50-100, 100-300, 300-1000, and 1000-10,000

pounds. Still another bracket is contemplated for packages of 5 pounds or less, which might be handled in mail bags. There are five principal tests which have been employed as performance tests for containers in shipping and warehousing: the drop, the revolving drum, the Conbur (inclined plane), the vibration, and the compression test; different modifications of these are outlined. The easiest type of handling is that involved in a full car- or truckload shipment from manufacturer to ultimate consumer; the requirements for this service are much less severe than those for less-than-car- or truckload, air mail, express, etc. Still other shipping hazards are presented by commercial and military export shipments. An additional factor which must be taken into consideration is the contact between the package and its contents. In easy loads, the entire inner surface of the container is in contact with the contents; in a medium load, there is partial contact and, in a difficult load, there is very little contact on account of the irregular shapes of the contents. A fourth possibility is a concentrated load with contact between contents and container over a very small area. These data indicate that shipping-container tests should not be employed without some knowledge of the performance level involved. It is not considered economical to give full and complete protection to the contents of a package for any kind of shipping; unnecessary expense from overpacking is just as wasteful as the loss resulting from underpacking where some of the contents are damaged. Reference is made to the specific provisions adopted by the Porcelain Enamel Institute (*cf.* B.I.P.C. 19: 428, 725). E.S.

SLIME PREVENTION

MEEUSE, A. D. J. Slime control in paper mills. V. I.-Pamphlet no. 14: 23 p. [1949] [In Dutch; English summary]

The occurrence of slime in paper mills. types of slime involved, and methods of control are reviewed. Several disinfectants are discussed; of these, the organic mercurials and chlorinated phenols seem to offer the best possibilities. Hazards connected with the technical application of these compounds are mentioned. 13 references. E.S.

SHEMA, B. F. Fundamentals of slime control. Paper Ind. 31, no. 5: 600-2, 607 (August, 1949).

The fundamental aspects of slime occurrence and control are discussed, including losses in the mill caused by slime, types of slime and points of infection, microbiological activity, the effects of bleaching, the importance of white-water treatment, the influence of mill design, seasonal variations, and methods for locating and controlling slime. L.E.W.

SPECIFICATIONS

DICKEY, ROGER C. Follow specifications. Graphic Arts Monthly 21, no. 8: 84, 86 (August, 1949).

The author stresses the importance of following container specifications, even though the converter may feel that other stock would be better. Specifications should include the name of the product, size of the box, specific data concerning the stock to be used, and information on the style and use of the carton, copy and proofs, engravings, exact color of inks, finishing treatment, packing of the boxes, marking of the cases or packages, and time and method of delivery. R.R.

STARCH

WOLFROM, M. L., GEORGES, L. W., THOMPSON, ALVA, and MILLER, I. L. Enzymic hydrolysis of amylopectin. Isolation of a

crystalline trisaccharide hendecaacetate. J. Am. Chem. Soc. 71, no. 8: 2873-5 (August, 1949).

The digestion of waxy maize starch with malt amylases followed by acetylation of the hydrolyzate gave a crude product, which was essentially β-maltose octaacetate. By utilizing a chromatographic technique a second crystalline compound was obtained. By analysis, this substance was shown to be a trisaccharide hendecaacetate, m.p. 134-136° C., $[\alpha]_D^{25} + 86°$ (chloroform). No β-isomaltose octaacetate was found. 21 footnotes. E.S.

STATISTICAL METHODS

CATLIN, J. B. Testing and the statistician. Tappi 32, no. 8: 340-5 (August, 1949).

Statistical methods for improving measurements made by technical control men in the paper industry are discussed under the headings: precision and accuracy, scales and significant figures, new tests and improving present ones, significance of measurement, indirect measurements, attributes, and judgment measurement. The author does not attempt to teach statistics; his main object is to arouse the interest of technical men in the industry in the possibilities of statistical procedures. In conclusion, the statement is made that statistical methods make a very important contribution to the paper industry and will some day take their place beside the methods of chemistry, physics, and the engineering sciences which are now employed in technical control. 5 figures and 11 references. E.S.

STORAGE BATTERIES

VAUGHAN, K. A. Maintenance of lead acid industrial truck batteries. Paper Mill News 72, no. 34: 72, 82-3 (Aug. 20, 1949); *cf.* B.I.P.C. 19: 506.

The present article is more detailed than the previous reference, but deals with the same subject. E.S.

STREAM POLLUTION

ERSPAMER, AUGUST S., and RICE, WILLIAM D. Treatment of pulp and paper mill waste; sedimentation and sludge handling. Ind. Eng. Chem. 41, no. 8: 1806-9 (August, 1949).

After reduction of the pollutional load to a minimum inside the Spring Grove, Pa., mill of the Glatfelter Co. by improvements in equipment and operation, a large volume of main effluent wastes remained which required outside treatment. The wastes included the chlorination and caustic extraction-stage washer filtrates in the bleach plant, de-inking water discharge, paper-machine losses, and general wash-ups. In order to determine whether a treatment plant could be technically and economically justified, a pilot plant was constructed and put into operation; the equipment and operating procedures are described. The studies were carried out on the stabilized mill wastes to obtain information on sedimentation and sludge handling. Plain settling effected an over-all reduction of 60% in turbidity, 85% in suspended solids, and 98% in settleable solids; the optimum detention time was two hours. Mechanical flocculation was found to have a slight effect. When approximately 400 p.p.m. of alum were used, a 60% reduction in the color of the waste resulted; pickling liquor, on the other hand, tended to increase the color of the effluent from the pilot plant. When sludges produced by plain settling were filtered on a rotary vacuum filter, the concentration of the sludge had a decided effect on the loadings; higher concentrations resulted in increased loadings.

Cakes produced with the 6-minute filter cycle were drier, thicker, and easier to handle than those obtained with the 2.25-minute cycle. The use of lime (flocculant) and carbon (inert filter aid) for sludge conditioning resulted in an increase of about 45% in net loadings. Approximately 25% increase in loading was obtained by 24-hour compaction of the sludge. The pilot plant has proved a satisfactory demonstration unit, and the data obtained have been utilized as a basis of design for a proposed full-scale treatment plant. 6 figures. E.S.

SULFATE MILLS

ANON. New MacMillan mill will produce early in 1950. Pulp & Paper 23, no. 9: 64, 66, 68 (August, 1949); *cf.* B.I.P.C. 19: 659-60.

The finished products of the new 200-ton bleached-kraft mill of Nanaimo Sulphate Pulp, Ltd., which is located away from the main Vancouver Island highways and railway, will probably be transported by the rail ferries which are now delivering most of the construction materials. Eventually the mill will have its own wharf for deep-water shipping. A Ramney water installation system, utilizing groundwater naturally filtered through the soil from lake and creek seepage, is the first of its kind in the industry. The wood-preparation plant, pulp manufacture, their equipment, the Fourdrinier machine, and the Flakt drier are described and some of the construction and mill personnel are mentioned. R.R.

ANON. Progress at the Nanaimo mill; an interim report on the construction and equipment. Pulp Paper Mag. Can. 50, no. 8: 81-2 (July, 1949); *cf.* B.I.P.C. 19: 659-60.

The information given is similar to that published in the previous reference. E.S.

SULFITE PROCESS

ERDTMAN, HOLGER. The sulphonation and delignification of wood by the sulphite process. Tappi 32, no. 8: 346-8 (August, 1949).

When wood is heated with bisulfite cooking acid, sulfonation of the lignin takes place with the formation of a "solid" insoluble lignosulfonic acid. This acts as a cation exchanger and removes the calcium ions from the cooking liquor which becomes acidic. The sulfite process then enters the second phase characterized by the conversion of the "solid" lignosulfonic acid into soluble forms. The chemistry of the mechanism is discussed. E.S.

SULFITE WASTE LIQUOR

ANON. A new alcohol plant: advanced process and equipment. Pulp & Paper 23, no. 9: 44, 46, 48, 51 (August, 1949).

An illustrated description is given of the equipment and process used at the new Gatineau, Que., alcohol plant, which uses sulfite waste liquor from the Canadian International Paper Co. as its raw material. The plant, owned and operated by Commercial Alcohols, Ltd., is designed to produce 9000 gallons of alcohol daily from 900,000 gallons of liquor effluent. It is essentially similar to, although larger than, the Bellingham, Wash., plant. The liquor recovery, cooling, neutralization, fermentation, and distillation are described. A novel adjunct to the distillery is a magnesia insulation plant, where magnesium oxide or hydroxide is carbonated with the carbon dioxide recovered from the alcohol fermentation tanks. A magnesium carbonate slurry incorporating 10% asbestos fiber is mechanically molded into 85%-magnesia insulating slabs and pipe covering at about 3,000,000 bd. ft./year. R.R.

BEATH, L. R., and HILL, H. S. Electrical evaporation of waste sulphite liquor. Pulp Paper Mag. Can. 50, no. 8: 89-94 (July, 1949); Paper Ind. 31, no. 6: 722, 724, 726, 736 (September, 1949); *cf.* B.I.P.C. 19: 376.

A new method of evaporating sulfite waste liquor by using electrical power is described. In co-operation with Foster-Wheeler Limited, three different experimental evaporators were built and the process was extensively tested on a small pilot-plant scale in the units having evaporative capacities up to 2½ tons of water per day. The method and the apparatus finally developed (third type of evaporator) are considered suitable for commercial scale evaporation of sulfite waste liquor. The details of the evaporator constructions are given, supplemented by illustrations and diagrams. The economics of the method are very favorable where secondary electrical power is available for evaporation and the concentrated waste liquor is used for fuel. A pilot-plant installation was planned for the Riverbend mill of Price Brothers, designed on the principles of the laboratory unit no. 3. However, at this stage of planning, another development (cooking for high-yield pulps which will greatly reduce the solids content of the evaporator feed liquor) and the recent shortage in secondary power, made it advisable to defer construction until the results of the high-yield project are more definitely known. E.S.

GADD, G. O. Inhibiting factors in the fermentation of sulfite waste liquor. Finnish Paper Timber J. 28, no. 7 A: 61-7 (April, 1946). [In Swedish; English summary]

During the fermentation of sulfite waste liquor, difficulties may be encountered because of the presence of certain chemical compounds, notably directly titratable sulfur dioxide (I), acetaldehyde (II), and furfural (III). The inhibiting action of these three compounds was investigated and the following chief conclusions were drawn from the results: (I) has a different effect on commercial yeast and that obtained from sulfite waste liquor. In the first case, as little as 0.01% may cause a decrease in the percentage of fermented sugar (measured after a fermentation period of 24 hours), whereas the sulfite alcohol yeast will stand the presence of 0.02-0.03%, indicating that it has become partially acclimatized to (I). When (II) is present in quantities greater than 0.15%, fermentation is retarded. The inhibiting effects of small quantities of (I) are neutralized by (II) because of its known property of reacting with bisulfite. If the loss in aldehyde caused by this reaction is replaced, the alcohol yield rises. (III), which occurs regularly in the waste liquors from dissolving pulps, may have an inhibiting effect on fermentation; part of (III) is reduced by yeast. (I) is not completely bound by equivalent quantities of (III). 16 tables and 1 diagram. E.S.

JOHNSON, A. MARGARET, and MARSHALL, H. BORDEN. A survey of the utilization of waste sulphite liquor as a tanning agent. Pulp Paper Mag. Can. 50, no. 8: 98-104 (July, 1949).

A survey of the literature (not intended as a critical review) is presented under the subheadings: theory of tanning, vegetable tannins, synthetic tannins, lignosulfonic acid, practical investigations, and fundamental investigations. 206 references. E.S.

SULFUR

HAY, WILLIAM W. What's ahead for the sulfur industry. Chem. Inds. 65, no. 2: 208-9, 294 (August, 1949).

Reserves of crude sulfur are being depleted twice as fast as before the war; a continuation of the present heavy rate of removal would place reserves at less than 25 years, according to conservatively estimated data of the Bureau

of Mines and the Geological Survey. Practically all elemental sulfur produced in the United States is mined from salt domes located on the Gulf Coast and Louisiana, the manufacture of chemicals (sulfuric acid in particular) and fertilizers and petroleum refiners accounting for the bulk of consumption. These channels are growing rapidly and will continue to require more and more sulfur; in addition, export demand is increasing. The possibilities of pyrites and by-product sources are reviewed, with special reference to two Canadian processes (the metallurgical process of the International Nickel Co. of Canada and the controlled roasting of pyrites under development by Noranda Mines, Ltd.), and the Orkla process for treating pyrites (a Norwegian development) and the sweetening of sour gas by stripping hydrogen sulfide from it in the United States. Of all these possibilities, only pyrites is a cheap and plentiful source for the future. 3 tables, 1 diagram, and 5 references. E.S.

SWELLING AND HYDRATION

NAYER, AMAR NATH, and HOSSFELD, RALPH L. Hydrogen bonding and the swelling of wood in various organic liquids. J. Am. Chem. Soc. 71, no. 8: 2852-5 (August, 1949).

A study has been made of the swelling of maple wood (*Acer saccharum* Marsh) in a variety of organic liquids including several homologous series of amines. A correlation has been suggested between the degree of swelling and the extent of hydrogen bonding between the constituents of wood and the swelling agent. The observed swelling behavior of the wood is explained by the hypothesis that the degree of swelling bears a direct relationship to the intensity of hydrogen bonding between the constituents of wood and the swelling agent and that steric hindrance is a controlling influence on the intensity of the hydrogen bonding. 17 footnotes. E.S.

TALL OIL

KHUDOVEKOV, V. D. Recovery and processing of crude sulfate soap. Bumazh. Prom. 24, no. 2: 22-5 (March-April, 1949). [In Russian]

The author suggests three possible processing methods for recovering the valuable components in a crude sulfate soap: refinement of the crude soap to yield a product which is suitable for industrial and domestic use, conversion of the soap to resin and fatty acid esters by the action of halogen derivatives (e.g., dichloroethane), or decomposition of the soap by the action of mineral acids to give a mixture of resin and fatty acids and inert material (crude tall oil). A schematic diagram is given. F G.S.

TEXTILE INDUSTRY AND FABRICS—ROTPROOFING

SIU, R. G. H., DARBY, RICHARD T., BURKHOLDER, PAUL R., and BARGHOORN, E. S. Specificity of microbiological attack on cellulose derivatives. Textile Research J. 19, no. 8: 484-8 (August, 1949).

Data are presented relating to the growth of 11 species of micro-organisms isolated from deteriorated cotton fabrics on various derivatives of glucose, mannose, cellobiose, and cellulose. A high degree of specificity was exhibited. As long as there was at least one firmly bound substituent in every anhydroglucose unit, the resulting derivative was not susceptible to microbiological attack. Under such conditions the nature of the substituent has relatively little influence on the degree of resistance imparted. This offered theoretical support for the postulation of multipurpose topochemical reactions as a means of mildewproofing cotton fabrics. 4 tables, 1 diagram, and 9 references. E.S.

TEXTILE INDUSTRY AND FABRICS—TESTING

BLOCK, S. S. Fungicide-treated cotton fabric; outdoor exposure and laboratory tests. Ind. Eng. Chem. 41, no. 8: 1783-9 (August, 1949).

Results are presented of two years of outdoor shade exposure, in Florida, of cotton fabric treated with fungicidal preservatives. Untreated 10-ounce cotton duck lost 67% of its tensile strength in one year and 93% in two years. Of the different fungicides applied to the fabric in a concentration of 1% of the dry weight of the treated fabric, only the copper and silver compounds stood up well after two years in the field. With the copper group the copper ion, rather than the anion or whole molecule, appeared to be the protecting agent. The mercurials and other heavy metal fungicides did not afford protection for the two-year period. The phenolic compounds were the only purely organic fungicides that rendered the fabric appreciably resistant to microbial decomposition. Water-repellent treatment improved the performance of the phenolic but not the copper fungicides. Laboratory soil burial tests were, in general, in agreement with the outdoor exposure tests. 12 references. E.S.

THIXOTROPY

ALFREY, TURNER, JR., and RODEWALD, CHARLES W. An experimental study of thixotropy in bentonite suspensions. J. Colloid Sci. 4, no. 3: 283-98 (June, 1949).

Investigations of the rheological properties of thixotropic systems encounter difficulties of two types: (1) those associated with the non-Newtonian character of the suspension at a given stage of gelation, and (2) those associated with the changes of structure with time, such as occur during the act of measurement. By using the torsional pendulum thixotrometer of Pryce-Jones (*cf.* J. Oil & Colour Chemists' Assoc. 17:305-75 [1936]) and the initial rate of restoration, the flow curves of thixotropic suspensions were determined at a given stage of gelation. Such bentonite suspensions were found to be essentially Newtonian immediately following thorough agitation, and the gelation process is mechanically reversible and reproducible. However, superimposed upon the mechanically reversible gelation process is a slower, mechanically irreversible process referred to as aging. The rate of aging is dependent upon temperature. Traces of dioxane which reduce hydrogen bonding very markedly reduce the tendency toward gelation. 1 table, 12 figures, and 10 references. J.W.S.

VISCOSITY

DAVIS, W. E., and ELLIOTT, J. H. Present status of the intrinsic viscosity determination. J. Colloid Sci. 4, no. 3: 313-20 (June, 1949).

A description is given of the experimental difficulties encountered in the determination of the intrinsic viscosity of polymers, together with recommended techniques, particularly for use by nontechnical personnel. Recommended procedures include: filtration of all solutions, a combination of a capillary large enough to avoid errors caused by dust particles together with a high-viscosity solvent to insure long flow times, dilution by volume in a modified Ubbelohde viscometer, and application of the kinetic-energy correction. The dilution viscometer used on a routine basis has given intrinsic viscosity results with a maximum spread of 2% of the average. For extrapolation of reduced viscosities (or reduced flow times) to infinite dilution, the Martin equation is satisfactory: $\log \eta_{sp}/c = \log [\eta] + k[\eta]c$. 4 tables and 1 illustration. A.M.B.

MACK, CHARLES. A theory of anomalous viscosity and elasticity. J. Colloid Sci. 4, no. 3: 343-6 (June, 1949).

Several properties of plastic systems are treated in terms of a statistical mechanical consideration of ordered and disordered sites and of the ratio of intermolecular holes to total number of molecules. Among the properties treated in this qualitative way are: (1) viscosity coefficient for a plastic system of rigid molecules, (2) thixotropy and stress hardening, (3) stress failure of plastics, and (4) deformation of systems of flexible molecules which exhibit rubber-like elasticity. A.M.B.

WATER AND WATER TREATMENT

MUNNS, E. N. Our water resources. Tappi 32, no. 8: 18A, 20A, 22A, 26A, 28A, 30A, 32A (August, 1949).

The reasons for water scarcities, declining ground-water supplies, floods, and increasing pollution of the waterways are discussed. The pulp and paper industry, one of the largest water-consuming industries, has a dual interest in the water resource; it needs an abundant supply, good quality, and constancy in availability of water, and is gravely concerned with its waste disposal problems. The causes of watershed deterioration (improper agriculture, forest fires, improper logging, soil frost, etc.) are described and the Connecticut River watershed is taken as an example of the consequences of abuses. The article is written for the purpose of emphasizing the importance of watershed conditions and making the pulp and paper industry realize that it can demonstrate greater interest in upstream conditions. E.S.

WOOD—EXTRACTIVES

ANDERSON, ARTHUR B., and ERDTMAN, H. L-Arabinose from heartwood of western red cedar (*Thuja plicata*). J. Am. Chem. Soc. 71, no. 8: 2927-8 (August, 1949).

From 470 grams of cedar heartwood, by the use of acetone (followed by a series of purifications), the authors isolated 1.29 grams L-arabinose, fully identified by melting point, specific rotary power, and its conversion into *p*-bromophenylhydrazone, melting at 152-154° C. L.E.W.

ERDTMAN, HOLGER, and GRIPENBERG, JARL. Structure of thujic acid ("dehydroperillic acid"). Nature 164, no. 4164: 316 (Aug. 20, 1949).

Inasmuch as the acid $C_{10}H_{12}O_2$ originally isolated by Anderson and Sherrard from western red cedar shows no relationship to perillic acid and, on degradation, gives rise to dimethyl malonic, β,β-dimethyl adipic, and β,β-dimethyl pimelic acids, a new structure with a seven-membered ring is proposed for it, the name of which should be changed from dehydroperillic to thujic acid. 4 references. L.E.W.

WOOD—MENSURATION

BRABENDER, G. J. Pulpwood measurement problems and methods. Tappi 32, no. 8: 337-9 (August, 1949).

Approximately 50 cords of Ontario black spruce pulpwood were analyzed with the following measurements being taken on each stick: (1) length of stick, (2) diameter—both ends and center, (3) density, and (4) wet weight. The individual sticks, approximately 100 inches in length, were piled in a one-cord rack and pile measurements were also taken. Similar rack measurements were taken on the same sticks after cutting to 50-inch nominal length. From

the data obtained, normal frequency distributions were found for length of stick, density, diameter, and shrinkage in volume caused by reduction from 100- to 50-inch length. No relationship was found between average stick diameter from woods-run pulpwood and solid volume per cord, although others have reported an increased volume at larger average diameter for selected diameter classes. Average density was found to increase with decreasing average diameter. The data for solid volume per cord from actual stick measurements gave results 1.3% higher than the volume obtained by the photographic method of Keepers (*cf.* B.I.P.C. 14:34). The results found for solid volume per cord were in substantial agreement with those reported by Martin (*cf.* B.I.P.C. 11:144) on similar wood. Furthermore, the relationship between sticks per cord and average diameter was found to be in good agreement with Martin's data. 6 references. E.S.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Weight-volume measurements of pulpwood and chips. Tappi 32, no. 8: 61-7A (August, 1949).

This is a revision of TAPPI Tentative Standard T 7 p-45 "Physical evaluation of pulp cord-wood." A dry and an immersion method are described for determining the volume of wood and weight of dry wood per laboratory-racked cord. In addition, methods are given for comparing the value so obtained with commercial scaling of pulpwood. 2 references. E.S.

WOOD FLOUR

HUKKI, R. T., and RUNOLINNA, U. Screen analysis of wood flour. Finnish Paper Timber J. 31, no. 12: 230-1 (June 30, 1949). [In English]

The principles and procedures involved in a screen analysis of wood flour with Tyler's Ro-Tap machine and a set of Tyler screens are described, including sample taking, hand and machine screening, and presentation of results. Fine wood flour has a tendency to adhere to metal surfaces; in addition, the fine particles obstruct the passage through the finer mesh sizes and are liable to agglomerate into lumps. To overcome these difficulties, a technique for screening the fine flours by hand prior to machine screening is outlined. E.S.

WOOD TRANSPORTATION

SMALLEY, C. H. Skidding pulpwood by gravity on a suspended wire. Pulp Paper Mag. Can. 50, no. 8: 132, 134 (July, 1949).

The author outlines the transportation of pulpwood by gravity on a suspended wire as applied to the removal of hardwood pulpwood from mountainous areas in northwestern Pennsylvania. A special attachment to be driven into the bolt of wood is described. 2 diagrams. E.S.

WOOD WASTE

ANON. Board panels turn waste into profits. Wood 4, no. 8: 15-16, 42-3 (August, 1949); *cf.* B.I.P.C. 19: 361.

The operation of the Rock Island Millwork Co. (a Weyerhaeuser affiliate), Rock Island, Ill., is described, where panel boards from wood waste and Durez (phenolic) resin are produced. The process is nearly automatic; the finished "Resinwood" panels, 4 ft. × 8 ft., weigh about 60 lb./cu. ft. The final properties of the boards vary according to type of wood waste, grinding, percentage of resin, moisture content, and curing cycle. Panels have been exposed to weather for long periods and have shown no sign of deterioration.

The board has excellent impact strength and is dimensionally stable in the presence of varying humidity conditions. It can be readily nailed, machined, and finished, and has all the workability of wood. E.S.

WOOL

LAFLEUR, KERMIT S. Wool damage data. Textile Research J. 19, no. 8: 497-504 (August, 1949).

Rough categories into which wool damage may be classified for study include hydrolysis, reduction and oxidation effects, and incipient decomposition caused by exposure to light or high temperatures in the presence of air. Data have been accumulated which describe some specific effects obtained by treating woolen swatches in boiling water as a function of time, in boiling acid (sulfuric) or alkaline (sodium hydroxide) solutions over a wide pH range, in boiling reducing (thioglycolic acid, zinc formaldehyde sulfoxylate) or oxidizing (hydrogen peroxide) solutions over a wide rH range, and upon drying at 260° F. for periods ranging to 128 hours. Quantitative measures of wool damage which have been used include loss of weight, area shrinkage, alkali solubility, wettability in water and 0.1 *N* sodium hydroxide, and loss of tensile strength. A general conclusion from the present data is that the water wettability may be useful for estimating degrees of damage to which many other tests are not sensitive. 14 tables, 1 diagram, and 18 references. E.S.

ZEIN

CLARK, RONALD L., and GRALOW, RAY C. Zein: versatile packaging resin. Modern Packaging 22, no. 12: 122-5, 154, 156 (August, 1949).

Zein, an alcohol-soluble protein from corn, is used widely in coatings, overprint varnishes, printing inks, and adhesives. It is especially suited to applications requiring properties of high grease resistance, scuff resistance, gloss, binding strength, and toughness, possesses remarkable resistance to microbial attack, and does not require inhibitors to prevent putrefaction of alcoholic or alkaline soap solutions. It is compatible with many resins which are used as extenders or modifiers. Zein is most commonly applied in aqueous alcoholic or similar polar organic solutions; a list of solvents and diluents is given. Aqueous solutions can be prepared with sufficient alkaline soap to maintain a minimum pH of 9. A third method of application is as a hot melt, which provides a high-speed, single-operation procedure free from solvent hazards. By the addition of relatively nonvolatile solvents (a list of which is given) to the composition, such properties as flexibility, adhesion, and softening point can be controlled. The successful application of zein depends on formulation. It can be applied from water solutions during the manufacture of paper and paperboard to reduce porosity, improve the surface, or impart grease resistance. Water solutions are also economically applied from the calender water boxes. Used on container stock for packaging milk, butter, or lard, it greatly reduces the penetration of paraffin during waxing. Zein-coated paper gives a more uniform appearance to gloss inks; zein-based inks or normal oxidizing printing inks show good adhesion to the coated paperboard. Adhesive applications include the use of zein in composition cork liners and bottle-label adhesives. R.R.

Patent Section

Although the abstracts of the United States patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. The abstracts of the Canadian patents are prepared from the claims published in the* Canadian Patent Office Record. *In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Until the printing branch is in full operation and up to date, the printing of specifications will be several months behind.

ADHESIVES

VALLANDIGHAM, VANCE V. Alginate containing adhesive compositions. U. S. patent 2,477,912. Filed Dec. 11, 1945. Issued Aug. 2, 1949. 3 claims. Assigned to Kelco Company. [Cl. 106-208]

An adhesive paste for laminating paper or boxboard sheets consists of water, a solid amylaceous substance having adhesive properties, and a quantity of a water-soluble salt of alginic acid not less than 0.2% nor more than 2.0% of the total weight of solids. E.G.S.

BARKERS AND BARKING

EMERY, WALTER B., and SHUFF, HUGH. Machine for debarking and trimming either standing or felled tree trunks. U. S. patent 2,477,922. Filed Sept. 18, 1946. Issued Aug. 2, 1949. 6 claims. [Cl. 144-208]

The machine has driven means for moving the unit up and down a tree trunk and carries a rotary cutter for stripping the bark from the tree; provisions are made for trimming off the branches and cutting the tree into sections. E.G.S.

BLEACHING

DODSON, ALFRED M. Cellulose bleaching. U. S. patent 2,478,379. Filed July 30, 1948. Issued Aug. 9, 1949. 15 claims. Assigned to Hercules Powder Company. [Cl. 8-105]

A method of inhibiting the viscosity reduction of cellulosic material with an acidic aqueous solution containing chlorine includes the preparation of an aqueous solution with a pH of 1.5-4.5, which contains chlorine and a nitrogen-containing compound selected from the group consisting of ammonia, mono-substituted ammonia, disubstituted ammonia, salts of ammonia, salts of mono-substituted ammonia, and salts of disubstituted ammonia; the concentration of nitrogenous substance may be varied from 0.03-16.0%, expressed as molecular

equivalent ammonia, based on the weight of chlorine. The cellulosic material is treated with the prepared solution. E.G.S.

LEVY, ROBERT M., and BRENNAN, JAMES E. Catalytic bleaching with chlorites. U. S. patent 2,477,631. Filed Feb. 21, 1945. Issued Aug. 2, 1949. 7 claims. Assigned to Ecusta Paper Corporation. [Cl. 8-105]

A process for bleaching cellulosic material consists of treating the material with an aqueous solution containing a chlorite of an alkali metal or alkaline earth metal, and a catalyst for the chlorite comprising a relatively small amount of a water-soluble salt of cobalt, nickel, or manganese, and maintaining the pH at a value of 5 to 8.5 during the bleaching operation. E.G.S.

BOARD

BURT, GEORGE H. Acoustical tile. Canadian patent 458,955. Filed Dec. 3, 1947. Issued Aug. 16, 1949. 3 claims. Assigned to The Celotex Corporation.

An acoustical tile comprises a fiber sheet having several independent, artificial sound-absorbing perforations which extend inwardly from one face of the sheet; the body of the tile is compacted immediately about the openings of the perforations, producing a material of greater density than the remainder of the tile. E.G.S.

COOK, HAROLD S., JR. Silicone insulating paper material. U. S. patent 2,477,787. Filed Nov. 15, 1945. Issued Aug. 2, 1949. 1 claim. [Cl. 229-3.5]

An insulating structure is created from cardboard which has been treated with hydroxychloroorganosilanes or covered with paper which has undergone this treatment; styrene is mentioned as a substitute for the silane. E.G.S.

BOARD SPECIALTIES

COKER, RICHARD G., and WOODS, AUBURN, JR. Fibrous conduit and method and composition for same. U. S. Patent 2,478,181. Filed July 23, 1943. Issued Aug. 9, 1949. 11 claims. Assigned to Sonoco Products Company. [Cl. 138-78]

A method of producing a fibrous conduit suitable for conducting fluids comprises spirally winding a plurality of paper plies to form a tube, bonding the plies during the winding operation with an adhesive composition containing a thermosetting resin and a carbohydrate adhesive, drying the wound tubes at 150-175° F., immersing the dried tubes in a heated bath of coal tar pitch at 300-315° F. to impregnate the tubes thoroughly with pitch, applying pressure to the pitch and tubes to force additional pitch into the tubes, and removing the tubes from the heated pitch. The adhesive composition and pitch are intimately associated between the paper plies and co-act to produce a water-resistant bond, which prevents delamination of the plies. E.G.S.

DAVIDSON, BRUCE J. Display box easel cover. U. S. patent 2,479,910. Filed July 17, 1944. Issued Aug. 23, 1949. 6 claims. Assigned to National Biscuit Company. [Cl. 206-45.2]

An easel for supporting a box in display position is formed from the cover of the box and consists of a back brace section having triangular sides and a closed lower end at the bases of the sides, a triangular support having an inclined supporting surface, and a hinge and tension section connecting the apex

of the support with the back brace at a point spaced from the bottom of the brace. E.G.S.

FOURNESS, CHARLES A. Tampon applicator. U. S. patent 2,478,576. Filed Sept. 26, 1946. Issued Aug. 9, 1949. 1 claim. Assigned to International Cellucotton Products Company. [Cl. 128-263]

A tampon applicator embodies co-operating parts which can be made to properly interfit without the exercise of great care to produce accurately sized parts; the paper tube elements of the tampon can be made by automatic tube-winding and cutting machinery. E.G.S.

NICHOLS, GORDON E. Easel back. Canadian patent 459,175. Filed Oct. 6, 1948. Issued Aug. 23, 1949. 15 claims. Assigned to Winthrop-Atkins Co., Inc.

A foldable easel back formed from an integral piece of stiff sheet material comprises a panel, a leg hinged to the upper edge of the panel, and a brace joined at its forward edge to the panel. E.G.S.

SCANDORE, NICHOLAS. Display box. U. S. patent 2,477,902. Filed April 16, 1949. Issued Aug. 2, 1949. 3 claims. [Cl. 206-45.31]

A display box has a hinged lid which is secured to the rear wall of the box and which carries a transparent window to permit viewing of the contents while the lid is closed. E.G.S.

SCHADE, FRANK S. Method of making loose-leaf binder case constructions. U. S. patent 2,478,132. Filed March 19, 1948. Issued Aug. 2, 1949. 6 claims. Assigned to National Blank Book Company. [Cl. 154-116]

A loose-leaf binder is made by laminating limp plastic sheets with panel inserts for stiffening the covers and back. E.G.S.

SHAFARMAN, NELLYE. Garment display form. U. S. patent 2,479,140. Filed May 27, 1946. Issued Aug. 16, 1949. 9 claims. [Cl. 223-68]

A flat cardboard blank folds into a form for displaying waists, blouses, and similar garments. E.G.S.

SNYDER, JAMES E. Package. Canadian patent 458,876. Filed Feb. 13, 1948. Issued Aug. 9, 1949. 6 claims. Assigned to Wingfoot Corporation.

A method is described for packaging several objects in a stiff sheet which has a row of elongated openings; one surface of the cardboard is covered with a thermo-stretchable film. Packaging is accomplished by heating the film, placing at least one object on the film at each of the openings, doubling the stiff sheet at the center lines of the openings, thus stretching the film over the objects, and then fastening the folded portions of the stiff sheet in this doubled-over relation. E.G.S.

VON LIEDTKE, RUDOLPH H. Method of impregnating fibrous articles. U. S. patent 2,478,439. Filed Sept. 4, 1945. Issued Aug. 9, 1949. 2 claims. Assigned to Line Material Company. [Cl. 117-65]

A method of impregnating paper pulp or other fibrous material is provided

in which substantially all of the air is drawn from the interstices in the wall of the material during an evacuation period; when the vacuum is relieved, pitch or other suitable non-absorbent, waterproof binding material is allowed to penetrate uniformly through the entire wall of the material; a dense, compact, waterproof article is formed which has high mechanical strength and high dielectric properties and is free from voids. E.G.S.

COMBINATION PACKAGES

McMAHAN, WALKER D. Package. U. S. patent 2,478,412. Filed Aug. 24, 1946. Issued Aug. 9, 1949. 6 claims. [Cl. 206-47]

A package is described in which a pile of sanitary napkins are carried in a box-like body so as to exert a pressure upon a pile of cells which are in the form of envelopes also arranged in the box so that the napkins and envelopes are maintained in the desired position in the box; the envelopes are provided for disposal purposes. E.G.S.

DIELECTRICS

HILL, LAWRENCE R., BINDSCHADLER, ERNEST, and CAMPBELL, JOHN A. Method of making electrical insulations. U. S. patent 2,479,357. Filed Jan. 10, 1945. Issued Aug. 16, 1949. 5 claims. Assigned to Westinghouse Electric Corporation. [Cl. 154-80]

A process for preparing an electrical coil capable of use at voltages of 4000 volts or more without adverse corona or other effects comprises winding a coil of insulated conductor, wrapping the assembled turns of the coil with a composite insulation composed of a cellulosic sheet fibrous material and mica flake insulation, subjecting the wrapped coil to evacuation to remove air, organic liquid binder (hydrocarbons, butyl alcohol, and higher alcohols), and other vaporizable material, applying a completely polymerizable liquid material to the evacuated coil to fill its pores and interstices, and polymerizing the liquid material into a solid impregnant. E.G.S.

DISPENSING CONTAINERS

HOFFMAN, ROBERT L. Dispensing container with rotatable closure. U. S. patent 2,480,096. Filed May 18, 1949. Issued Aug. 23, 1949. 4 claims. [Cl. 222-542]

A container for dispensing powdered material has a rotatable closure which is maintained in contiguous and flush relation with the inwardly overhanging beaded rim of the container. E.G.S.

DRYING—PAPER

TAIT, ALEXANDER W. Method of and apparatus for controlling paper-making machines. U. S. patent 2,479,031. Filed July 1, 1946. Issued Aug. 16, 1949. 9 claims. [Cl. 34-18]

A method is disclosed for drying a formed paper web, which consists of passing the web across a suction water-removing unit actuated by an electric current which is varied in proportion to the amount of water in the web, subsequently passing the web through a heated drying device, and utilizing the variations in current to vary the amount of heat in the drying device. E.G.S.

FOAM

YOUNG, FRANK W. Foam control in brown stock washing. U. S.

patent 2,478,150. Filed Sept. 19, 1945. Issued Aug. 2, 1949. 3 claims. [Cl. 252-361]

Provision is made for multi-stage countercurrent washing of brown stock on a single filter without objectionable foaming; the amount of foam which is produced in caustic recovery by washing is reduced and maintained at a minimum. This patent is closely related to U. S. patent 2,431,009; *cf.* B.I.P.C. 18:275. E.G.S.

FOLDING BOXES

ARTHUR, WILLIAM H. Carton. U. S. patent 2,479,456. Filed Aug. 24, 1944. Issued Aug. 16, 1949. 3 claims. Assigned to Container Corporation of America. [Cl. 229-14]

A wrapped carton is formed by initially securing a sheet of wrapping material to a carton blank and then folding the blank with the attached wrapping sheet into its final form, in which the wrapper completely encloses the carton. The container may be used in cases where an automatic overwrapping machine is not justified commercially, but where the carton may be set up, wrapped, and sealed by hand. E.G.S.

BALL, CHARLES O. Container. U. S. patent 2,478,358. Filed May 19, 1945. Issued Aug. 9, 1949. 3 claims. Assigned to Owens-Illinois Glass Company. [Cl. 229-38]

A paper blank is folded and shaped to form a rectangular tube which serves as the container body; an integral foldable portion is designed to form a closed end of the tube. The container is particularly adapted for holding liquids. E.G.S.

BALL, CHARLES O. Paper container. U. S. patent 2,478,359. Filed May 19, 1945. Issued Aug. 9, 1949. 4 claims. Assigned to Owens-Illinois Glass Company. [Cl. 229-38]

A paper container for liquids is provided which has a rectangular body and a closed bottom consisting of a single integral folded blank of sheet material; the carton is constructed so that corner joints are avoided, thus forming a structure which is not vulnerable to leakage. E.G.S.

COX, JOHN W. Carton. U. S. patent 2,479,213. Filed Jan. 8, 1945. Issued Aug. 16, 1949. 9 claims. Assigned to Shellmar Products Corporation. [Cl. 229-28]

A cellular egg carton is cut from an integral paperboard blank. E.G.S.

MACDONALD, JOHN A. Carton. Canadian patent 458,683. Filed Nov. 27, 1947. Issued Aug. 2, 1949. 5 claims. Assigned three twentieths to Lawrence W. Butler.

A paperboard carton has a double-walled partition; provision is made for handholes near the top of the container. E.G.S.

OVERLY, ELMER G. Envelope package. U. S. patent 2,478,635. Filed March 31, 1945. Issued Aug. 9, 1949. 1 claim. [Cl. 206-93]

A stationery box is adapted to hold two stacks of envelopes side by side in an accessible manner, so that successive removal of the envelopes does not disturb the orderly arrangement of the stacks; the box is folded and formed from sheet material and is free from adhesive and other attachments. This is a continuation of U. S. patent 2,425,895, issued Aug. 19, 1947. E.G.S.

HEATING (HIGH-FREQUENCY)

AUXIER, ROBERT W., and NORELLI, PATRICK. Laminating machine. U. S. patent 2,479,290. Filed Oct. 29, 1945. Issued Aug. 16, 1949. 2 claims. Assigned to Westinghouse Electric Corporation. [Cl. 154-1]

A machine is described for curing composite plates or sheets in a high-frequency electrical field; means are provided for applying a progressively increasing pressure to laminated sheets of fibrous material which carries a resinous binder. E.G.S.

INTERIOR PACKING

GORMAN, THOMAS J., JR. Bail-carrying partition for cartons. U. S. patent 2,479,739. Filed Dec. 1, 1947. Issued Aug. 23, 1949. 2 claims. [Cl. 229-42]

A partition for a carton has an interlocking structure which is designed to receive bails for cans or containers that are stored in the carton for shipment. E.G.S.

MACHINERY—CONVEYORS

SANDBERG, NELS H. Stacking conveyor. U. S. patent 2,477,830. Filed Aug. 3, 1945. Issued Aug. 2, 1949. 13 claims. Assigned to Waldorf Paper Products Company. [Cl. 271-68]

A conveyor is described which is pivotally mounted so that its delivery end may be raised and lowered; the blanks are dropped onto the loading platform directly from the end of the conveyor and the conveyor moves upwardly as the pile grows in height. E.G.S.

MACHINERY—CONVERTING MACHINERY

ANNEN, JAMES E. Machine for setting up cellular cartons. U. S. patent 2,479,994. Filed Oct. 31, 1945. Issued Aug. 23, 1949. 30 claims. Assigned to Sutherland Paper Company. [Cl. 93-37]

A machine is provided for setting up cellular cartons which are manufactured for distribution in the flat or collapsed condition and set up to receive the contents. E.G.S.

BUTTRESS, GEORGE A. Apparatus for forming plaster-keying depressions in plasterboard. U. S. patent 2,479,207. Filed May 11, 1946. Issued Aug. 16, 1949. 3 claims. [Cl. 25-44]

An apparatus is disclosed for forming a number of depressions in plasterboard before the plastic filler or body has set and while the cardboard or other paper cover sheets of the board are still wet; the depressions are shaped and dimensioned to provide for keying and bonding of plaster to the board when it is mounted on a wall or ceiling. E.G.S.

EPSTEIN, HARRY T. Method of making tubes of paper and the like and apparatus therefor. Canadian patent 458,900. Filed April 24, 1947. Issued Aug. 16, 1949. 6 claims.

This corresponds to U. S. patent 2,422,188; *cf.* B.I.P.C. 17:669. E.G.S.

GLASING, JOSEPH S., and MARCOTTE, HAROLD D. Method and machine for laminating. Canadian patent 458,873. Filed Nov. 12,

1947. Issued Aug. 9, 1949. 8 claims. Assigned to Westfield River Paper Company, Inc.

This is the same as U. S. patent 2,434,795; *cf.* B.I.P.C. 18:412. E.G.S.

SIDEBOTHAM, MELVIN H. Paper can making machine. U. S. patent 2,479,050. Filed March 21, 1945. Issued Aug. 16, 1949. 15 claims. [Cl. 93-39.2]

A machine is provided for assembling one cylindrical paper sleeve over another similar sleeve and then securing a paper bottom to one end of the double-walled assembly. E.G.S.

VAIL, DANIEL R. Cell case machine. U. S. patent 2,478,794. Filed July 16, 1945. Issued Aug. 9, 1949. 9 claims. Assigned to Henry C. Tuttle. [Cl. 93-37]

A machine is provided for assembling slotted partition strips in lattice form to make an inset for a container which will divide it into compartments for individual bottles; the machine is particularly adapted to handle preformed partition strips cut from relatively rigid, thick material, such as faced corrugated board. E.G.S.

MACHINERY—CUTTERS

CHRISTMAN, PETER J. Web cutoff device. U. S. patent 2,478,240. Filed Nov. 12, 1946. Issued Aug. 9, 1949. 9 claims. Assigned to Paper Converting Machine Co., Inc. [Cl. 164-66]

A high-speed web cutoff device has co-operating cutting rollers which are provided with co-acting knives; the angled and inclined knife of one roll co-acts with a straight knife set in a longitudinal groove in the periphery of the other roll; the high part of the inclined cutting edge enters into shearing relationship with the straight knife on the other roll in advance of the bite of the two rolls; the high part is accommodated in the groove as rotation progresses and as the point of shearing contact advances toward the low end of the inclined cutting edge. E.G.S.

HEWITT, JOHN W., JR. Pad forming machine. U. S. patent 2,478,485. Filed April 29, 1947. Issued Aug. 9, 1949. 17 claims. [Cl. 164-28]

An apparatus is provided for cutting out sanitary pads from a web of material fed between an assembly of die cutter rolls and a high-speed anvil roll; means are included for conveying the formed pads serially in spaced relation to a number of takeoff mechanisms operating in timed relation. E.G.S.

MACHINERY—FELT CONDITIONERS

VICKERY, FREDERICK W. Felt conditioner in paper making and like machines. Canadian patent 459,169. Filed Aug. 9, 1947. Issued Aug. 23, 1949. 6 claims. Assigned to Vickerys Limited.

A conditioner for felts used in papermaking consists of a suction box which communicates with vacuum openings in a felt contacting surface, at least one jet in the surface for supplying cleaning fluid to the felt, and means for supplying additional fluid to the suction box, in a direction away from the felt, for the purpose of avoiding accumulation within the suction box of undesirable matter derived from the felt. E.G.S.

MACHINERY—FOLDING MACHINE

HAND, LESLIE T. Paper folding machine and method. Canadian patent 458,994. Filed Feb. 19, 1947. Issued Aug. 16, 1949. 13 claims. Assigned to Morsegraph Inc.

A method of producing a stack of folded paper from a strip comprises forming a slack portion in the strip, forming a fold in the slack portion, gripping the paper adjacent to the fold, moving the fold toward a release position, forming an additional fold in the paper strip, gripping the paper adjacent to the second fold, and then releasing the paper gripped adjacent to the first fold. E.G.S.

MACHINERY—PACKAGING MACHINERY

BLESSING, CHARLES B. Garment packaging device. U. S. patent 2,479,552. Filed May 10, 1949. Issued Aug. 23, 1949. 29 claims. Assigned to Blessing Packaging Company. [Cl. 93-2]

A garment covering machine consists of a frame, a garment supporting post, means for supporting and guiding tubular paper to be drawn down toward and over the supporting post, means for forming fastened folded portions in the paper at one end of the garment supporting post, and means for removal of the garment and bag as a unit in the direction of the post axis. Detailed drawings are included. E.G.S.

LANDOLT, ERNST. Device for folding box blanks. U. S. patent 2,478,631. Filed June 28, 1945. Issued Aug. 9, 1949. 4 claims. [Cl. 93-49]

A plate of metal, artificial resin, or other material is adapted to accept a light cardboard box blank while the blank is partly folded so as to receive the goods to be packed; the plate is intended to lend rigidity to the blank. E.G.S.

MACHINERY—PASTING MACHINE

DOOLIN, EARL B. Package sealing machine. U. S. patent 2,477,968. Filed April 6, 1948. Issued Aug. 2, 1949. 8 claims. [Cl. 154-42]

Provision is made for heat-sealing machinery with a conveyor apparatus which may be rapidly adjusted with respect to the heating and pressing members to enable the machine to accommodate and seal different sizes of heat-sealable bags. E.G.S.

O'NEIL, JAMES H. Method of applying protective spots to the pads of closure caps. U. S. patent 2,479,959. Filed June 23, 1947. Issued Aug. 23, 1949. 6 claims. Assigned to Continental Can Company, Inc. [Cl. 154-89]

In a method for attaching metal foil spots having a thermoplastic adhesive coating to a pad of a closure cap, an electric current is passed through the metal foil for a sufficient time to heat the foil until the adhesive becomes tacky, and then the spot is pressed against the pad. E.G.S.

MACHINERY—PRESSES

HORNBOSTEL, LLOYD. Diaphragm control for press roll assembly. Canadian patent 458,942. Filed May 13, 1948. Issued Aug. 16, 1949. 12 claims. Assigned to Beloit Iron Works.

In a press roll assembly, a pair of longitudinally relatively adjustable members are provided, one of which is connected to a pneumatically operated diaphragm and the other to a pivoted crank arm supporting a press roll; a device is also included for remote indication of the existing relative adjustment of the two members. E.G.S.

MACHINERY—SCREENS

CRAM, HERVEY G. Disk pulp screen. U. S. patent 2,480,119. Filed Feb. 25, 1946. Issued Aug. 30, 1949. 4 claims. [Cl. 92-30]

A disk pulp screen is provided in which a positive pulsation of the pulp through the screen plates acts to dislodge any foreign material such as slivers, which, if allowed to collect on the plates, would retard the flow of acceptable pulp through the screen. E.G.S.

MACHINERY—SHEET-FEEDING MECHANISM

DAVIDSON, WILLIAM W. Collator. U. S. patent 2,479,060. Filed July 1, 1944. Issued Aug. 16, 1949. 9 claims. Assigned to Davidson Manufacturing Corporation. [Cl. 270-58]

In a collator, a conveyor receives sheets at a number of receiving stations for the progressive forming of groups of sheets on the conveyor; sheet feeders separate single sheets from supply stacks and deliver the separated sheets to the receiving stations. Means are provided to automatically stop all feeders in response to a succession of faulty feeding cycles. E.G.S.

NITRIC ACID PROCESS

DESORBAY, GERMAINE M. H. Process for obtaining paper pulp. Canadian patent 458,897. Filed April 18, 1946. Issued Aug. 16, 1949. 14 claims.

A process for manufacturing paper pulp from a vegetable substance consists of treating the raw vegetable material for 3-48 hours in 30° Bé. nitric acid solution (at the same time cooling the material), removing most of the nitric acid solution, treating the vegetable substance with a 0.5-5.0% alkaline lye solution without heating above 15°C., and finally draining the lye from the material. E.G.S.

PAPER—COATED

BICKNELL, JOHN A. Dual-toned metallic-coated web. U. S. patent 2,479,094. Filed Feb. 25, 1946. Issued Aug. 16, 1949. 13 claims. Assigned to S. D. Warren Company. [Cl. 41-26]

An embossed dual-toned metallic-coated flexible paper web has a surface which carries a continuous layer of a coating composition consisting of finely divided metallic particles (metallic sulfide or oxide) and an adhesive; the particles produce a pattern of alternate contrasting bright and dull areas. E.G.S.

BOLLENS, WALTER F. Coating material. U. S. patent 2,476,802. Filed Nov. 22, 1944. Issued July 19, 1949. 5 claims. Assigned to Swift & Company. [Cl. 99-171]

A method of treating fiber food containers comprises the incorporation of 2-6% (on a dry basis, of the coating composition) levulinic acid as an active ingredient of a coating composition (containing about equal quantities of gelatin and glucose and normally susceptible to mold growth on storage) and sub-

sequent application of the edible coating to the surface of the container; the coating retards mold growth on the treated surface. E.G.S.

HOLLAND, WILLIAM E., STANLEY, ALEXANDER J., and CHESNUT, JAMES A. Machine for impregnating webs. U. S. patent 2,477,604. Filed Jan. 11, 1945. Issued Aug. 2, 1949. 4 claims. Assigned to Industrial Tape Corporation. [Cl. 91-31]

This is equivalent to Canadian patent 449,362; *cf.* B.I.P.C. 18:807. E.G.S.

JENNINGS, HARLEY Y. Paper coating method. Canadian patent 458,578. Filed Oct. 30, 1947. Issued Aug. 2, 1949. 8 claims. Assigned to Copeman Laboratories Company.

An apparatus for applying a coating to a strip of backing material consists of a supply roll, driven winding and applicator rolls, and means for tangentially feeding the strip to the applicator roll and radially feeding to the winding roll. E.G.S.

PAPER SIZING

WILSON, WILLIAM S. Method of sizing paper. Canadian patent 458,618. Filed Feb. 12, 1947. Issued Aug. 2, 1949. 8 claims. Assigned to Monsanto Chemical Company.

A method of sizing paper includes the addition of rosin size and high basic aluminum sulfate to the paper pulp in the beater; an amount is added which is sufficient to obtain maximum sizing but insufficient to reduce the pH of the furnish below 5; the aluminum sulfate contains about one-fifth to one-third less sulfate than that required by the formula $Al_2(SO_4)_3$. E.G.S.

PAPER SPECIALTIES

BALL, CHARLES O. Paper receptacle. U. S. patent 2,478,360. Filed May 19, 1945. Issued Aug. 9, 1949. 5 claims. Assigned to Owens-Illinois Glass Company. [Cl. 229-38]

A paper container for milk or other liquids has a rectangular body and a bottom end folded from a single sheet of material; the bottom of the receptacle is designed to avoid a thickness of more than three layers or plies of the folded material, so that leakage is prevented. E.G.S.

CAMERON, DANIEL D. Paper. Canadian patent 458,983. Filed April 8, 1947. Issued Aug. 16, 1949. 7 claims. Assigned to Hercules Company.

In a process for the manufacture of paper having insecticidal properties, provision is made for the addition of an aqueous emulsion of, or a dispersible powder containing 1,1,1-trichloro-2,2-bis-(*p*-chlorophenyl) ethane to the paper furnish. E.G.S.

KOHL, WILLIAM R. Container inspection window having light excluding shutter. U. S. patent 2,479,627. Filed Aug. 16, 1946. Issued Aug. 23, 1949. 2 claims. [Cl. 206-45.31]

A transparent inspection window is provided for mothproof garment storage bags. E.G.S.

MCCASKILL, OSCAR E. Stock sheet for postage stamps. U. S.

patent 2,477,886. Filed Nov. 20, 1945. Issued Aug. 2, 1949. 3 claims. [Cl. 40-159]

A stock sheet for postage stamps comprises a backing sheet and several flap-forming strips which are attached at their bottom edges to the sheet so as to leave their top margins free as stamp flaps. E.G.S.

PRITCHARD, JOSEPH H. Device for holding food products and the like. U. S. patent 2,479,700. Filed Aug. 13, 1945. Issued Aug. 23, 1949. 7 claims. [Cl. 229-54]

A paper holder for carrying and supporting articles of food, such as sandwiches, potato chips, and cake, consists essentially of two pocket-forming members attached to a middle rigid element, preferably constructed of corrugated cardboard. E.G.S.

WALLACE, PAULINE E. Educational cutout doll dressing toy. U. S. patent 2,479,052. Filed May 5, 1947. Issued Aug. 16, 1949. 3 claims. [Cl. 35-53]

A container consists of a box and cover; the cover carries the picture of a person and has cutout openings in the normally clothed areas of the picture. Means are provided for making strips of cloth visible through the openings to represent clothing on the pictured person. E.G.S.

WILSON, EARL D. Method of manufacturing small current selenium rectifiers. U. S. patent 2,479,446. Filed May 10, 1946. Issued Aug. 16, 1949. 3 claims. Assigned to Westinghouse Electric Corporation. [Cl. 175-366]

A method of producing selenium rectifiers of small surface area comprises coating at least one face of a 10-mil nickel sheet with a 2-mil layer by immersing the sheet in molten selenium (350° C.) containing 0.01% bromine and spinning off the excess coating, coating the selenium surface with a film of cadmium sulfide by evaporation, coating the sulfide surface with a 0.1-mil layer of metal by sublimation of a metallic vapor to form a counter electrode, facing the counter electrode with a layer of stiff paper, and subdividing the unit thus formed into smaller rectifiers of the surface area desired by a press-punching operation. E.G.S.

PLASTICS—PAPER-BASE

NOVAK, IZADOR J. Plastic sheet material. Canadian patent 459,148. Filed July 19, 1947. Issued Aug. 23, 1949. 26 claims. Assigned to Raybestos-Manhattan, Inc.

A process of shaping thermoset material comprises heating C-stage thermoset resin-impregnated (phenolic aldehyde type) absorptive paper above 250° F. to impart optimum forming flexibility, shaping the heated material, and permitting it to cool while holding it in the shaped form. E.G.S.

PULP STONES

BETH, HUGO W. H. Pulpstone. Canadian patents 458,626 and 458,627. Filed May 7, 1947. Issued Aug. 2, 1949. 2 and 5 claims. Assigned to Norton Company.

These are the same as U. S. patents 2,450,226 and 2,450,227; *cf.* B.I.P.C. 19:220. E.G.S.

BETH, HUGO W. H. Pulpstone. Canadian patent 458,628. Filed May 10, 1947. Issued Aug. 2, 1949. 2 claims. Assigned to Norton Company.

This is the same as U. S. patent 2,467,878; *cf.* B.I.P.C. 19:676. E.G.S.

RAMIE

WHITE, JAMES L., and HAWKER, HERMAN W. Apparatus for preparing bast fibrous plants and process. U. S. patent 2,480,067. Filed March 11, 1946. Issued Aug. 23, 1949. 7 claims. One half of White's interest assigned to Hawker. [Cl. 19-6]

An apparatus for preparing ramie and similar bast fibrous materials for further processing consists of a series of spaced rotary cutters for cutting the green stalks, as harvested, into short lengths which will yield the desired final staple length, a conveyor for feeding the stalks tranversely in succession to the cutters, rotary snaring means for separating the leaves and stems from the stalk lengths, means for removing the leaves and stems from the snaring mechanism, means for guiding the stripped stalk lengths endwise, and crushing means for flattening the guided stalk lengths to break up the woody and pithy material without damaging the fiber. E.G.S.

SHIPPING CONTAINERS

AMATEL, HAROLD. Container for and method of wrapping irregular objects. U. S. patent 2,479,453. Filed Aug. 5, 1943. Issued Aug. 16, 1949. 10 claims. Assigned to Westinghouse Electric Corporation. [Cl. 206-46]

A container is provided for irregular objects, such as those having a cylindrical shape with lateral projections; a cradle device is socketed to partially enclose the cylindrical body portion as well as to support the lateral projections and prevent shifting, at the same time allowing rotation of the cylindrical portion without removal. The container is specified for shipping magnetrons. E.G.S.

FUERST, EDWIN W. Display package. U. S. patent 2,477,793. Filed May 20, 1948. Issued Aug. 2, 1949. 2 claims. Assigned to Dow Corning Corporation. [Cl. 206-45.28]

A shipping container is provided which can be used for counter display purposes; when the package is opened, display panels automatically open to displaying position. E.G.S.

SHIPPING CONTAINERS—MULTIWALL BAGS

LEE, HARRY E. Valve bag. U. S. patent 2,478,113. Filed Sept. 28, 1945. Issued Aug. 2, 1949. 2 claims. Assigned to St. Regis Paper Company. [Cl. 229-62.5]

This is equivalent to Canadian patent 440,038; *cf.* B.I.P.C. 17: 462. E.G.S.

TEXTILE INDUSTRY AND FABRICS—TESTING

BOOR, LADISLAV, and FLUCK, LINTON A. Crease resistance testing. U. S. patent 2,479,303. Filed Jan. 16, 1945. Issued Aug. 16, 1949. 3 claims. Assigned to American Cyanamid Company. [Cl. 73-100]

A method for the determination of crease resistance of sheet material (particularly textile fabrics) consists of folding a standard-sized sample of the material to be tested over a relatively thin, sharp, horizontal supporting edge, clamping the folded material over the edge with a spring-pressed pressure device which exerts a predetermined pressure, leaving the device in place for a predetermined length of time, and then removing the test strip. The apparatus is provided with a movable protractor having an adjustable and separate arm; the base lines of the protractor and arm are movable so as to coincide with the angle at or near the apex of the folded test material. The specimen is not handled after it has been folded. E.G.S.

WET STRENGTH

KEIM, GERALD I. High wet-strength paper. Canadian patent 459,127. Filed April 8, 1947. Issued Aug. 23, 1949. 8 claims. Assigned to Hercules Powder Company.

In a process for the manufacture of paper having high wet-strength properties, a glycine-modified urea-formaldehyde resin (0.1-8.0%, based on the dry weight of the paper) is added to the paper furnish prior to the formation of a web. E.G.S.

KEIM, GERALD I. High wet-strength paper. Canadian patent 459,128. Filed April 8, 1947. Issued Aug. 23, 1949. 8 claims. Assigned to Hercules Powder Company.

In a process for the manufacture of high wet-strength paper, a sulfanilic acid-modified urea-formaldehyde resin (0.1-8.0%, based on the dry weight of the paper) is added to the paper furnish prior to the formation of a web. E.G.S.

SCHENCK, WILLARD A. Paper and method of making same. Canadian patent 459,141. Filed Aug. 9, 1946. Issued Aug. 23, 1949. 8 claims. Assigned to The Munising Paper Company.

A method for preparing absorptive, high wet-strength paper from waterleaf paper without changing its appearance and feel consists of impregnating waterleaf paper with a solution of the following ingredients: self-polymerized ω-aminocaproic acid, 1% by weight; oxalic acid, 4%; ethyl alcohol, 93%; and formalin (37%), 2%. The paper is dried in the presence of oxalic acid, the oxalic acid is removed, and the resulting product is redried. E.G.S.

AUTHOR INDEX TO BOOKS

American Chemical Society. *Division of Rubber Chemistry* 2
Aries, R. S. 2
Arnold, L. K. 1
Barrell, W. L., Co. 2
Bergmann, E. D. 1
Cornell University 1
Edminster, F. C. 1
Guise, C. H. 1
Gustafson, A. F. 1
Hamilton, W. J., Jr. 1
Hermans, P. H. 1
Howard Publishing Company, comp. . 2
Inoue, T. 1
Iowa Engineering Experiment Station 1
Ishihara, J. 1
Kerr, C. 1
Monier-Williams, G. W. 2
National Research Council. *Division of Engineering and Industrial Research. Conference on Electrical Insulation* 1
Northeastern Wood Utilization Council 2
Owen, L. N. 2
Pollak, A. 2
Printing Industry of America 2
Randall, R. 1
Ries, H. 1
Simonsen, J. L. 2
Sweeney, O. R. 1
Tamamushi, B. 1
U. S. Department of Agriculture 2
Wharton School of Finance and Commerce. *Labor Relations Council* 1

AUTHOR INDEX TO ABSTRACTS

The letter P preceding a page number indicates a patent abstract.

Agronin, T. 7
Alfrey, T., Jr., ... 48
Alsfeld, M. 35
Amatel, H. ..... P 63
American Cyanamid Company ..... P 63
American Leather Belting Association 20
Anderson, A. B. 49
Annen, J. E. ..... P 57
Aries, R. S. 18
Arthur, W. H. ..... P 56
Auxier, R. W. ..... P 57
Avery, B. F. 14
Backman, A. 32
Bailey Meter Company 24
Baldwin, A. T. 12
Ball, C. O. ..... P 56, P 61
Barghoorn, E. S. 47
Bates, H. E. 24
Beath, L. R. 46
Bell, A. 19
Beloit Iron Works ..... P 59
Belvin, C. H. 12
Beth, H. W. H. ..... P 62, P 63
Bicknell, I. A. ..... P 60
Bindschadler, E. ..... P 55
Blakemore, F. T. 21, 23
Blaser, B. 35
Bleiweis, J. L. 28
Blessing, C. B. ..... P 59
Blessing Packaging Company ..... P 59
Block, S. S. 48
Blomqvist, E. 35
Boerner, B. J. 40
Bollenbacher, K. 16
Bollens, W. F. ..... P 60
Boor, L. ..... P 63
Brabender, G. J. 49
Brecht, W. 31
Brennan, J. E. ..... P 53
Burkholder, P. R. 47
Burt, G. H. ..... P 53
Butler, L. W. ..... P 56
Butler, M. L. 16
Buttress, G. A. ..... P 57
Callahan, T. P. 39
Cameron, D. D. ..... P 61
Campbell, J. A. ..... P 55
Carlsson, G. E. 36
Catlin, J. B. 44
The Celotex Corporation ..... P 53
Chaney, L. F. 13
Chesnut, J. A. ..... P 61
Christman, P. J. ..... P 58
Clark, R. L. 51
Clark, T. F. 34
Coker, R. G. ..... P 53
Collins, T. T., Jr., ... 8
Container Corporation of America .. P 56
Continental Can Company, Inc. ..... P 59
Cook, H. S., Jr. ..... P 53
Copeman Laboratories Company ..... P 61
Cox, J. W. ..... P 56
Craig, R. B. 14
Cram, H. G. ..... P 60
Cruickshank, G. A. 24
Darby, R. T. 47
Davidson, B. J. ..... P 53
Davidson, W. W. ..... P 60
Davidson Manufacturing Corporation . P 60
Davis, H. G. 25
Davis, W. E. 48
de Lorenzi, O. 16
Denisov, Y. A. 3
Desorbay, G. M. H. ..... P 60
Dickey, R. C. 43
Dodson, A. M. ..... P 52
Donskoi, A. V. 17
Doolin, E. B. ..... P 59
Dow Corning Corporation ..... P 63
du Pont de Nemours, E. I., & Company 38
Easton, P. 23
Eckhart, C. G. 30
Ecusta Paper Corporation ..... P 53
Elliott, J. H. 48
Emery, W. B. ..... P 52
Epstein, H. T. ..... P 57
Erdtman, H. 45, 49
Ernst, W. 39
Erspamer, A. S. 44
Evans, K. J. 20
Fischer, H. D. 12
Fisher Scientific Company 40
Flander, C. E. 26
Fluck, L. A. ..... P 63
Fourness, C. A. ..... P 54
Fuerst, E. W. ..... P 63
Gadd, G. O. 46
Gaut, M. 17
Georges, L. W. 43
Glasing, J. S. ..... P 57
Gorman, T. J., Jr. ..... P 57
Gralow, R. C. 51
Greaves, C. 5
Gripenberg, J. 49
Hagenstein, W. D. 15
Hand, L. T. ..... P 59
Harrington, L. 3
Hawker, H. W. ..... P 63
Hay, W. W. 46
Hayes, J. C. 20
Heinonen, E. M. 30
Hercules Company ..... P 61
Hercules Powder Company ..... P 52, P 64
Hewitt, J. W., Jr. ..... P 58
Hill, H. S. 46
Hill, J. M., Jr. 35
Hill, L. R. ..... P 55
Hinz, G. 8

Hoffman, R. L. ..... P 55
Holland, W. E. ..... P 61
Holt, L. 38
Honauer, H. 21, 22
Hornbostel, L. ..... P 59
Hossfeld, R. L. 47
Hukki, R. T. 50
Imperial Chemical Industries, Ltd. *Plastics Division* 33
Imset, O. 5
Industrial Tape Corporation ..... P 61
International Cellucotton Products Company ..... P 54
Ivanov, S. N. 31
Jayme, G. 26
Jeffers, H. J. 23
Jennings, H. Y. ..... P 61
Johnson, A. M. 46
Julson, J. O. 29
Keim, G. I. ..... P 64
Kelco Company ..... P 52
Khudovekov, V. D. 47
Kohl, W. R. ..... P 61
Koroleff, A. 38
Kovalev, V. P. 33
LaFleur, K. S. 51
Landolt, E. ..... P 59
Lardner, F. 41
Larinkari, J. 8
Lavery, H. H. 17
Lee, H. E. ..... P 63
Lehtimäki, L. 18
Levy, R. M. ..... P 53
Lincoln, W. B., Jr. 42
Linder, A. 11
Line Material Company ..... P 54
Lithographic Technical Foundation 10, 30
Loyd, D. B. 4
McCaskill, O. E. ..... P 61
Macdonald, D. A. 15
MacDonald, J. A. ..... P 56
McIntosh, D. C. 5
Mack, C. 49
McMahan, W. D. ..... P 55
McNeer, R. D., Jr. 10
Marcotte, H. D. ..... P 57
Marsh, P. B. 16
Marshall, H. B. 46
Meeuse, A. D. J. 43
Metallizing Engineering Company ... 23
Miller, I. L. 43
Mitchell, J. H., Jr. 29
Monsanto Chemical Company ..... P 61
Morsegraph Inc. ..... P 59
Mory, H. 6
The Munising Paper Company ..29, P 64
Munns, E. N. 49
Murphy, E. A. 18
Murphy, E. K. 25
National Biscuit Company ..... P 53
National Blank Book Company ..... P 54
National Cotton Council 6
Nayer, A. N. 47
Nepenin, Y. N. 7
Neubrech, W. L. 27
Nichols, G. E. ..... P 54
Nordhammar, G. 30
Norelli, P. ..... P 57
Norton Company ..... P 62, P 63
Novak, I. J. ..... P 62
O'Neil, J. H. ..... P 59
Overly, E. G. ..... P 56
Owens-Illinois Glass Company ..P 56, P 61
Paper Converting Machine Co., Inc. ..P 58
Paper Sales 29
Patch, C. E. 40
Patterson, M. E. 4
Persson, V. 11
Pitzer, J. C. 34
Pollak, A. 18
Powlinson, K. 24
Pritchard, J. H. ..... P 62
Quackenbos, H. M., Jr. 35
Raper, K. B. 16
Ratliff, F. T. 8
Raybestos-Manhattan, Inc. ..... P 62
Renard, A. 22
Reynolds, A. P. 25
Rice, W. D. 44
Rigid Containers, Ltd. 41
Rodewald, C. W. 48
Runolinna, U. 50
Ryan, J. 41
St. John, E. 26
St. Regis Paper Company ..... P 63
Sandberg, N. H. ..... P 57
Sandermann, W. 39
Scandore, N. ..... P 54
Schade, F. S. ..... P 54
Schädler, M. 20
Scheffer, T. C. 17
Schenck, W. A. ..... P 64
Scherer, P. C. 10
Schmidt, K. 21
Seidel, M. P. 35
Senchenko, Y. I. 17
Sergeant, S. V. 13
Shafarman, N. ..... P 54
Shapiro, A. D. 6
Shellmar Products Corporation ..... P 56
Shema, B. F. 43
Shirley, H. L. 15
Sholl, H. A. 18
Shuff, H. ..... P 52
Sidebotham, M. H. ..... P 58
Silverman, L. 9
Siu, R. G. H. 47
Skeen, J. R. 37
Smalley, C. H. 50
Snyder, J. E. ..... P 54
Sonoco Products Company ..... P 53
Sorkin, M. 39
Southwick, C. A., Jr. 34
Staff, C. E. 35
Stanley, A. J. ..... P 61
Strachan, J. 36
Studer, M. 11
Sutherland Paper Company ..... P 57
Swift & Company ..... P 60
Tait, A. W. ..... P 55
Taylor, G. G. 12
Technical Association of the Pulp and Paper Industry 31, 50
Thompson, A. 43
Tikhomirov, A. M. 23
Timell, T. 9
Timgren, L. 27
Tinker, E. W. 15
Torgeson, O. W. 17
Toulouse, J. H. 42
Tuttle, H. C. ..... P 58
U. S. Office of International Trade ... 41
Vail, D. R. ..... P 58
Vallandigham, V. V. ..... P 52
van der Wyk, A. J. A. 11
Vaughan, K. A. 44
Vickery, F. W. ..... P 58
Vickerys Limited ..... P 58
Viles, F. J., Jr. 9
von Liedtke, R. H. ..... P 54
Vranek, A. O. 40
Waldorf Paper Products Company ...P 57
Walker, W. C. 30
Wallace, P. E. ..... P 62
Warren, S. D., Company ..... P 60
Watts, L. F. 15
Webb, I. H. 37
Weck, J. 33

Weingand, R. 7
Westfield River Paper Company, Inc. .P 58
Westinghouse Electric Corporation .....P 55, P 57, P 62, P 63
White, J. L. .....P 63
White, W. A., Jr. 22
Wiggins, L. F. 5
Willets, W. R. 32
Wilson, E. D. .....P 62
Wilson, W. S. .....P 61
Wingfoot Corporation .....P 54
Winthrop-Atkins Co., Inc. .....P 54
Wise, L. E. 16
Wolfrom, M. L. 43
Woods, A., Jr. .....P 53
Wright, G. F. 19
Young, F. W. .....P 55
Zettlemoyer, A. C. 30
Zima, J. J. 25
Zimmerman, G. D. 24

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